The Builder.

No. CLXVIII.

SATURDAY, APRIL 25, 1846.

BRISTOL was the scene of an event, on Tuesday last, which will be long remembered by a large number of persons. Efforts in favour of the restoration of the fine church of St. Mary Redcliffe have been made for several years past, an able and energetic committee have sat constantly, and a considerable sum of money has been raised. Some short time ago, as our readers are aware, contracts were entered into, and the work was commenced in earnest. The ground has been lowered several feet all round the structure, which entailed lowering a large number of graves and vaults; perfect drainage has been effected, so as to stop the injuries which damp was occasioning; the approaches have been improved, and Tuesday last was appointed by the mayor, John Kerle Haberfield, Esq., and the corporation, assisted by the ancient Society of Free Masons, to lay the first stone in restoration of the fabric.

Enthusiasm on the subject has been gradually gaining ground, and on this occasion was manifested in an extraordinary degree. The neighbouring streets as well as the churches, were decorated with banners and evergreens, and before the procession started, were crowded with persons as far as the eye could reach.

The stone to be laid, formed part of the last buttress on the north side of the chancel. Galleries were erected on each side of it for the mayoress and about 500 ladies, and were filled at an early hour.

The procession formed on Colston's parade, and must have been more than a quarter of a mile in length; the Free Masons, about 200 in number, with their banners and insignia, forming a prominent feature. The effect of the scene, as the procession ascended the steps of the beautiful north porch, and gradually filled the churchyard, around the platform prepared for the ceremony, was very striking.

It is estimated that in the whole, there could not have been fewer than from fifteen to twenty thousand persons assembled, including amongst those immediately around the platform, the four preceding mayors.

The architects received the mayor and corporation on the platform. The sheriff, vicar, archdeacon, the officers of the grand lodge, the churchwardens, Mr. Proctor, the chairman of the restoration committee, contractors, and clerk of the works followed.

The Rev. Martin Whish, the vicar, having offered up an eloquent prayer, the chairman of the committee read the following address, which was inscribed on vellum, and afterwards handed to the mayor.

"SIR,—It is my gratifying duty to convey to your worship the request of the vicar, churchwardens, and vestry of St. Mary Redcliffe, that you will be pleased to lay the first stone for the restoration of this parish church.

Regarding the magnificent edifice committed to our charge, as one of the finest remaining monuments of the piety and skill of our forefathers, we are most anxious to interest men of the highest reputation, and influence in the truly national work of restoring its pristine splendour, so that it may be transmitted a sacred heir-loom to succeeding generations. And we are satisfied that, while the object at heart will be materially advanced by their assistance, they will, themselves, obtain gratification and honour hereafter, in return for their exertions.

It is with no ordinary pleasure then, worshipful Sir, that we find you disposed to enter warmly into our views, and to strengthen us by your co-operation, and we regard your presence on this occasion, as an evidence of fresh efforts on the part of the citizens of Bristol in favour of this justly celebrated structure, now fast hastening to ruin.

Upwards of four hundred years ago, a princely citizen of Bristol erected this church:—to-day, you, another citizen, commence its renewal; and it may be considered a singular and interesting coincidence in favour of your fitness for the task, that the office of chief magistrate was held by Canynge, six years, and that you have been already called thereto three times.

To aid you in the pleasing task, we invite the assistance of the ancient Society of Free Masons, to whose progenitors Europe is indebted for the greater number of the wonderful buildings raised in the middle ages; and we offer our cordial thanks for their ready co-operation.

Our earnest hope, Sir, is, that under the divine blessing of the Almighty Being, to whose worship this church is dedicated, no long period of time will elapse before a complete restoration is effected; and that you and they, who have laid the first stone, may assist to set the last.

The Mayor then replied as follows:—

Pursuant to the requisition of the vicar, churchwardens, and vestry of St. Mary Redcliffe Church, and of the committee appointed for its restoration, first presented to me, I attend here this day, as Mayor of Bristol, to lay the foundation-stone for the restoration of one of "the most famous, absolute, fairest, and goodliest parish churches within the realms of Great Britain and Ireland." In furtherance of such restoration, I now proceed to perform that duty, and may God Almighty bless, protect, and preserve this church.

The stone being then raised, Mr. Britton, in handing the trowel to the mayor, made some appropriate observations, and asked the assistance of all in carrying out the undertaking. The mayor having laid the stone amidst loud cheers, then said:—

I perfectly agree in the appeal which has been made by the vestry to the good feelings of all who enter this church, thereby asking that each individual, as he explores its beauties, will consider himself responsible for its protection, and should he see the thoughtless or ignorant attempting to deface or injure any part, or forgetful of that decorum proper to be observed in a place dedicated to divine worship, he will at once restrain them. Redcliffe Church is a building honourable to the nation; and, as a national monument, claims the protection of all who enter its walls.

I rejoice that your exertions have been so far crowned with success, that you have been enabled to commence the great and holy work of restoration; and there is no doubt that, under the architects to whom it is intrusted, this restoration will prove effective. There is no question, that if their views can be carried out, our city would possess a parochial church, and the west of England a national monument, of unequalled beauty: one to be visited and admired by multitudes of strangers of our own and foreign nations.

It remains for me to mention, that I feel a great honour has been conferred on me in being permitted to take a part in these proceedings. I beg to express my warmest thanks to the very Reverend the Dean of Bristol, to those gentlemen who have honoured me with their attendance, and especially to the Deputy Provincial Grand Master and the Society of Free Masons, for their kind assistance in the ceremony of this day.

The Free Masons then surrounded the stone, and Deputy Grand Master, Mr. Bushell, applied the level to the stone, sprinkled corn, wine, and oil upon it, and called upon the architects to exhibit the plans, and the various officers to perform their several duties. Mr. A. H. Palmer, the secretary, read aloud the inscription on the stone,* and the chaplain, the Rev. Caddell Holder having delivered an excellently worded prayer, the Deputy Grand Master spoke as follows:—

I assure you, that it has afforded the fraternity of free and accepted Masons of this province, great pleasure in accepting the invitation of the Restoration Committee to attend here this day, for the purpose of lending their assistance to fix the foundation-stone of the restoration of this magnificent structure of former ages.

It is an act strictly within their line of duty, and as they have recently assisted at similar ceremonies at the Guildhall and the Barracks, the fraternity here consummate their labours by assisting to rebuild, and preserve from ruin, a temple dedicated to the worship of the Most High. This, too, is not the first occasion on which Free Masons have worked in this building, for the experienced craftsman will readily discover various marks and proofs of the labours of our ancient brethren.

To no purpose more noble could we now lend our aid, for as Free Masonry totally discountenances impiety, immorality, and irreligion, so should we lend our warmest efforts to maintain a structure, wherein the ignorant may be taught, the vicious reclaimed, and the great and eternal interests of godliness promoted.

I congratulate the mayor on his participation in such a delightful work, and to the Restoration Committee I would say,—Go on, and prosper in your doings; may you live to see that which is now begun in harmony and peace conducted with order, and, I would most sincerely add, finally concluded in brotherly love.

The architects being then invited to address the meeting, Mr. Godwin said:—

As the opportunity had been afforded him of connecting himself in the minds of the citizens of Bristol with the restoration of their noble church, he could not avoid availing himself of it. He entered upon the task with equal pride and pleasure, and would devote his best energies to carry out the restoration effectively. St. Mary Redcliffe belonged not simply to Bristol but to Europe, and any departure from

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* THIS STONE,
In Restoration of St. Mary Redcliffe Church,
was laid on the 21st day of April, A.D. 1846, by the
Right Worshipful JOHN KERLE HABERFIELD, Esquire,
Three times Mayor of Bristol, assisted by the
Ancient Society of Freemasons;
The Right Worshipful HENRY GEORGE, Esquire,
Provincial Grand Master;
The Right Worshipful WILLIAM DOBB BUSHELL, Esquire,
Deputy Provincial Grand Master;
in the presence of the Clergy, Corporation, and Citizens
of Bristol.
MARTIN RICHARD WHISH, A.M., Vicar.
THOMAS PROCTOR, Chairman of the Restoration Committee.
JOHN WARRY, Jun. } Churchwardens.
JOHN HARE, }
JOHN BRITTON, F.S.A. } Architects.
GEORGE GODWIN, F.R.S. }

the original would be an offence against posterity. Throughout Germany and France a desire for the restoration of ancient buildings was universally apparent; around every town-hall and every church a scaffolding was to be seen. The same spirit he was glad to say was shewing itself in England. The present meeting, the most gratifying at which he had ever been present, was a triumphant reply to the assertion that men in Bristol were too actively engaged in making fortunes to attend to matters of literature, or regard the works of antiquity. The erection of that building, however, was itself sufficient to refute the calumny, and the present citizens were anxious to emulate its founder. Reference had been made in Mr. Proctor's address, to the coincidence that the present mayor, like Canynge, had held that office three times. The coincidence might be shewn to extend further. Simon de Burton, who founded the church in the thirteenth century, was three times mayor; Everard le Frenshe, who was buried in the transept, was three times mayor; Sir Thomas Mede, whose monument was at the east end of the north aisle, close to where they then stood, was mayor three times, so that it would seem that connection with St. Mary Redcliffe was a reward to all those men who had gained the confidence, like their present able and excellent chief magistrate, of their fellow-citizens. The presence of the Free Masons on this occasion must be a source of pleasure to all who, like himself, had inquired into their early history, and had found how much was owing to them. Even at a time when information was confined to a few, and the other sciences were in a low state, architecture flourished, and Europe was covered with wonderful edifices—hardly to be imitated. This was chiefly owing to the Free Masons, who, when the clergy were sent into distant parts missionaries of religion, followed them as missionaries of art, and raised for them fitting temples. It was curious to note that one of the few ancient documents describing for the workmen the parts of the building, which remained, related to the doorway of St. Mary Redcliffe, and had been of great value in determining the meaning of many technical expressions. He would not detain them longer than to say he trusted all would unite to obtain the completion of the building, each in their several circles, and he would ask them for three honest, hearty, English cheers for the restoration committee who had worked so well, to be received by them as thanks for what they had done, and encouragement for what they were going to do.

The cheers, which were taken up by the multitude, and prolonged for several minutes, having subsided, Mr. Proctor said in reply:—

On behalf of the committee, I gratefully acknowledge the commendation bestowed upon us, and assure all who feel interested in the preservation of this noble church, that no efforts shall be wanting on their part to procure a complete and faithful restoration. One thing I will venture to assert in the name of the committee, that the admirers of this magnificent structure need not fear its injury at their hands, as no mending or patching will be attempted, but, so far as the means at the disposal of the committee will enable them to go, a sound and legitimate restoration shall be effected, though it be found necessary to undertake the work severy by severy. That the restoration shall be completed, they will require the aid of all who wish the building preserved; and that it shall be legitimate and faithful, they look with confidence to the gentlemen under whose direction the work is proceeding.

The ceremony being over, the hundredth psalm was sung by the children of the various free schools, and the meeting then adjourned in regular order to the church, where a selection of anthems, ending with God save the Queen, was sung, and terminated the proceedings.

The greatest praise is due to the committee for the admirable manner in which the whole was conducted, as well as to the Free Masons for the able part they played in the ceremony; there was no waiting, no confusion, and all were in their proper places. We have entered thus fully into particulars because we think, with one of the speakers, that St. Mary Redcliffe belongs not alone to Bristol but to Europe, and that all our readers are interested in its restoration. The co-operation of the present respected mayor, and the proceedings of Tuesday last, will give new vigour to the committee, and must lead to satisfactory results.

PROFESSOR WILLIS ON ECCLESIASTICAL ARCHITECTURE.

On Tuesday last, the Rev. Robert Willis, M.A., Jacksonian Professor at Cambridge, delivered the first of a course of eight lectures on "Ecclesiastical Architecture," at the Royal Institution. He commenced by stating, that his subject comprised the history of a Christian church; and as ecclesiastical architecture was composed of many separate branches, he should then endeavour to give them a general view of the subject, commencing with those religious edifices which preceded the Christian period. If we considered attentively the arrangements of buildings, we should remark in every one a distinct view to its particular purpose. In a church a pulpit, a reading-desk, and an altar, combined with facilities for accommodating a congregation, were necessary features; in a court of justice, there must be space for a large number of persons, with places for the judges, the jury, and the prisoner; a theatre must be so contrived that a large audience can see, and hear with ease, and have a place for the stage and scenery; these were considerations which had immediate influence upon the plan of each building. When all this had been provided for, the architect might say, that the plan was impracticable, that the roof could not be supported without certain props or intermediate walls, and therefore they would at once see, that the consideration of purpose and construction must go hand-in-hand together. Methods of construction have been borrowed, in all ages, by one nation from another, and we might, perhaps, take some plan that suited our requirements, and adopt it to the intended building. But here stepped in the architect. There was a certain character of design, which suited the purpose of each building, and though he was not disposed to give too much influence to this principle, it was one which should be laid hold of, and might be turned to good account. This character would be understood by supposing a theatre were to be used for a church. People would say, this is in too gay a style for the purpose; and *vice versa*, a building might be too sombre and grave for a theatre. The power to impress the fitting character was a peculiar mental gift, given, as it appeared, to certain men, who found it impossible to communicate it to others, whilst in that particular, many had failed, who possessed the highest abilities. But returning to the theatre: after finding that it was too gay, it might be said, that the symbollism, or the subjects represented, were not of the proper kind; for, as in a church, besides the æsthetic character, we should expect that art would be employed upon subjects, bearing upon the purpose for which the structure was erected. There was, indeed, supposed to be another kind of symbollism, which might rather be called occult symbollism, that which referred a group of three forms to the sacred number 3, and the eight sides of a font to the seven days of the week, and a supposed eighth day of regeneration, and by which some were of opinion, the proper character of church architecture was to be gained; but he believed that these notions were quite unworthy of the present state of intelligence. We must endeavour to catch the enthusiasm, which filled the architects in former days, and we could only understand their works by considering the state in which the ritual was, and the history of the art, and we might then obtain a church suited to our own wants.

The professor explained the meaning of *style*, as used in reference to the general character and distribution of the building, and also to the modes, in which different nations had practised their architecture, and said, that he should now commence the history of churches, shewing how, step by step, we had been led to the modern period. He should show the steps by which Gothic architecture arose, and how, and whether, the main characteristics of Christian churches were derived from buildings that went before them. To make his meaning more clear, he had devised the card-board models upon the table. They were not, strictly speaking, models, but drawings of the elevations, arranged together upon the ground plan. An architect's representation of a building required different drawings; these by a mental process, he was able to combine, so as to give an accurate impression of the appearance of the building. What the architect did in his mind, he, the professor, had done in card-board, and he hoped the idea might be valuable. All lecturers on architecture had felt the difficulty of explaining by drawings, to a general audience, and any one who expected to get satisfactory models from other hands than his own, would be inevitably disappointed.—Much credit is due to Professor Willis for these models;—by means of a few bits of board for steps, and pieces of card-board, with parts cut out, or drawn upon them, for walls, with some ingenious contrivances for holding them together, which also admitted of their being readily taken to pieces, a knowledge of ancient architecture was given to many amongst his audience, which would probably have taken them some months to acquire.

The mere arrangement for pagan and Christian worship, continued the Professor, was essentially different. In the former, the statue of the god was within the temple, but the multitude were without, whilst in the latter, the congregation worshipped within the church, which consequently required an arrangement suited to the capabilities of hearing and sight.—The pagan temples, according to Vitruvius and existing remains, were here described from the models. First of all was the *temple in antis*, having two columns only, between antæ, these being merely decorations placed at the ends of the walls. The prostyle temple had a portico of columns, not inclosed by walls, but projecting one or more columns in extent from the *cella*. The word *porticus* had been a puzzle to antiquaries, it was in its original sense a colonnade, and the "portico," or porch in front of the temple was properly the pronaos, the space before the naos or cella. The peripteral temple was the prostyle temple with a row of columns all round, which added greatly to its magnificence, but, as they would observe, did not render it any the better adapted for a large congregation; there was still no light but at the porches at the ends, and over the doors. The word peripteral was derived from the Greek words *περι*, about, and *πτερὸν*, a wing, signifying that it had wings or porticoes all round; and it was remarkable that the word "aisle" was derived from "ala," also signifying a wing. In the dipteral temple, another rank of columns was added. Still no step had been gained towards providing for a large congregation. The cella was, it was true, a little enlarged, but the principle of its arrangement was the same, whereas the Christian temple was a Pagan temple turned inside out. From the dipteral temple was produced the pseudo-dipteral, by omitting the inner rank of columns; this lessened the expense, and allowed a greater width to be given to the ambulatories. The roof in all these was of wood, the ceilings of the porticos being of stone. The first great modification was in the hypæthral temples. There was much difficulty in restoring the plans of these, as the walls of temples had often been destroyed, probably for the sake of the materials. Mr. Lucas's model might be referred to. The alteration consisted in leaving a portion un-

covered, which let in the light, and at the same time let in the rain; how the sides were roofed, or whether there was a reservoir for the water, as at Pompeii, was matter of dispute. There was also an interior row of columns on each side, dividing the space into three aisles,—for himself, said the professor, the term "centre aisle," was so convenient, that he should always use it. The internal columns were in two tiers. These, with the one called amphi-prostyle, were the various forms of Grecian temples.—Between the Greek temples and the Roman, there were some essential differences. The former were supported on steps surrounding the edifice, whilst the latter were raised upon a basement or podium, the steps being at end. In Roman temples, the walls were seldom plain, but had three quarter columns or pilasters. Whilst the arrangement was prostyle, that usually adopted, the appearance was peripteral. The interior of the cella was often elaborately enriched, as might be seen in the temple at Baalbec.

Thus the Pagan temples were unfitted for the Christian religion, and he described them, rather to shew why the latter did *not* arise out of them. Still, it was true that when the Christian architects were first applied to, they in some degree followed preceding models. The Professor then, referring to the arrangement of the basilicas, said, that it had generally been thought, that the early Christian churches were derived directly from those structures. But though Christianity was legalized under Constantine, Christian churches had existed previously. Had the Christian worship taken place in other places, as in cemeteries, there would have been no going forth to destroy the churches, in times of persecution, as recorded by certain writers; and there could be little doubt that large churches did exist, previous to the time when the basilicas were granted by Constantine. In the plan of the basilica there were many essential differences. The Professor then noticed the church of St. Clement at Rome, probably the most interesting example of the early form of church; in which the episcopal chair, and seats for the clergy in the apse, are still remaining, and postponed the further consideration of his subject till Tuesday next.

ON THE DEVELOPMENT AND CONVERSION OF CONVEX SURFACES.

To change the form of one figure into that of another of equivalent area, when possible, constitutes a very interesting problem in architecture and other branches of the practical arts; and when this problem is combined with that of the development of curved surfaces upon a plane, it forms one of the most important and useful applications of *descriptive geometry*. The subject, when considered in all its generality, is by far too extensive to admit of being fully and systematically treated of in the pages of a periodical publication; its complete discussion would require a volume, and much study and labour would be necessary to point out all the cases in which the principles of development and conversion might be usefully applied; the practical man, however, will be at no loss to discriminate the cases that come within the range of his own operations, and the examples which we have chosen for the subject of illustration in the present paper, will serve to shew in what manner the conversion is to be effected in all cases of a similar nature.

Let ABDE, fig 1., be a right cylinder, of which the diameter is AB, and length AE or BD, and let it be required to describe a circle that shall be equal in area to the convex surface of the cylinder.

Now the solution of this problem involves no difficulty, it is rigorously accurate, and yet we are persuaded that very few of our most intelligent operatives are acquainted with the method of performing it; in order, therefore, to put them in the way of resolving this and other problems of a kindred nature, we think proper in the first place to investigate the method of construction, and for this purpose it is necessary to admit the existence of the following properties, viz.: That the circumferences of circles are to one another in the same proportion as their diameters, and that the areas of circles are to one another in the same proportion as the squares of their diameters; these properties are demonstrated by

Fig. 1

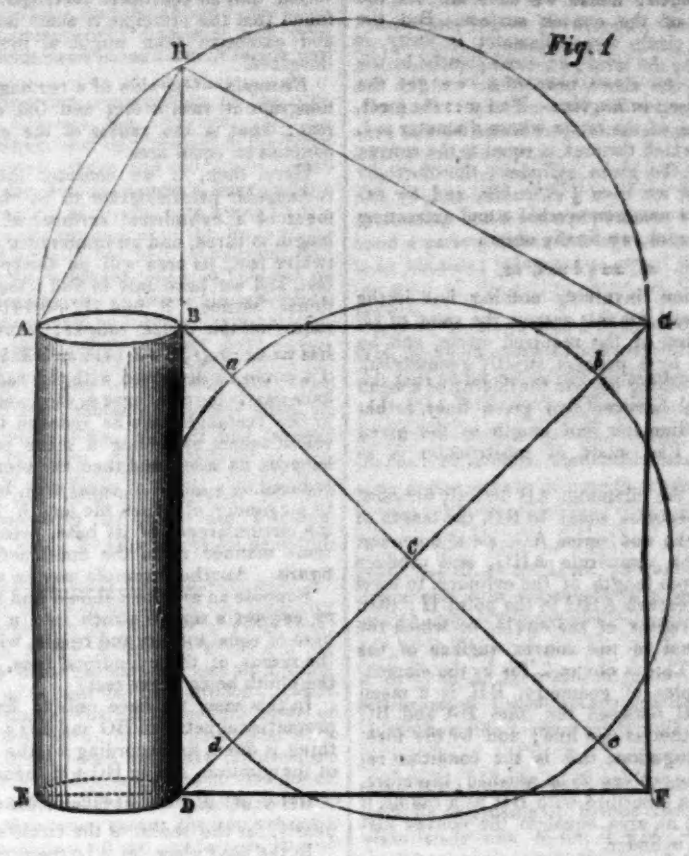
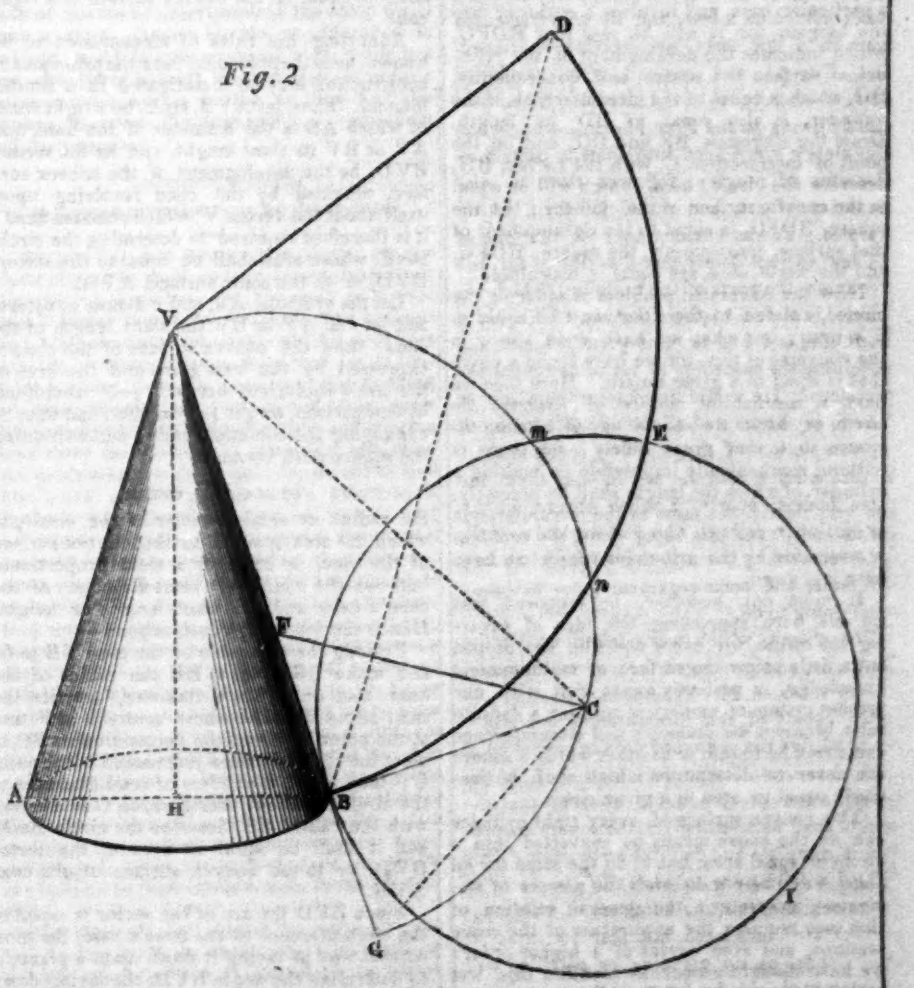


Fig. 2



Euclid in the sixth and twelfth books of his "Elements of Geometry," and are, consequently, well known; the investigation is therefore as follows:—

Put π = the circumference of a circle whose diameter is an unit; d = AB, the diameter of the given cylinder; l = BD, the length of the given cylinder, and $\delta = ac$, the diameter of the circle, whose area is equal to the convex surface of the cylinder; then we have, by the first of the above properties, $1 : \pi :: d : d\pi$, the circumference of the circle whose diameter is AB, or the circumference of the end of the given cylinder; and by the rules of mensura-

ion, the convex surface of a cylinder is expressed by the circumference of its end drawn into its length; hence we have $ld\pi$ for the expression of the convex surface. But the area of a circle whose diameter is unity, is expressed by the term $\frac{1}{4}\pi$; consequently, by the second of the above properties, we get the following proportion, viz:—$1^2 : \frac{1}{4}\pi :: \delta^2 : \frac{1}{4}\pi\delta^2$, for the area of the circle whose diameter is δ, or that of which the area is equal to the convex surface of the given cylinder; therefore by comparison, we have $\frac{1}{4}\pi\delta^2 = ld\pi$, and by expunging the common symbol π and extracting the square root, we finally obtain

$$aC = \tfrac{1}{2}\delta = \sqrt{ld},$$

an expression involving nothing but linear quantities, and for this reason, the value of $\frac{1}{2}\delta$, or the radius of the required circle, can be determined by a process strictly geometrical, requiring nothing beyond the finding of a mean proportional between two given lines, or between the diameter and length of the given cylinder. The mode of construction is as follows:—

Produce the diameter AB directly forward, until BG becomes equal to BD, the length of the cylinder; and upon AG, as a diameter, describe the semicircle AHG, and produce DB, the given length of the cylinder, to meet the circumference AHG in the point H; then is BH the radius of the circle, of which the area is equal to the convex surface of the cylinder. This is obvious, for by the elementary principles of geometry, BH is a mean proportional between the lines BA and BG placed together as one line; and by the foregoing investigation, this is the condition required by the problem to be satisfied; therefore, if a circle be described with BH as a radius, it will contain an area equal to the convex surface of the cylinder.

This is the general method of construction, but the figure which we have given represents a particular case, and involves a curiosity into the bargain, for it will be seen that BDFG, which indicates the development of the cylindrical surface is a square, and, consequently, BG, which is equal to the circumference of the cylinder, is also equal to BD its length. Draw the diagonals, BF and DG, and on the point of intersection, C, with the radius, BH, describe the circle, *abcd*, which will be equal to the convex surface of the cylinder; but the square, BDFG, is equal to the development of that surface, consequently, the square, BDFG, and the circle, *abcd*, are equal in magnitude.

Now the celebrated problem of squaring the circle, is *to find a square that shall be equal to it in area;* but what we have done above is the converse of this, for we have found a circle that is equal to a given square. Here then we have a mechanical method of *squaring the circle*, or rather we should say of *circling the square* to a very great nicety; for there is nothing mechanically impossible in making a cylinder, of which the length shall be precisely, or very nearly, the same as the circumference of its ends,* and this being done, the problem is resolvable by the principles which we have here laid down.

It must not, however, be supposed that we are here supporting the idea of squaring the circle, for every one who has dipped but a little below the surface of mathematical knowledge, is perfectly aware that with our present system of numerical notation a definite ratio between the diameter and circumference can never be found, or in other words a square can never be determined which shall be precisely equal in area to a given circle.

The convex surface of every right cylinder can by the above means be converted into a circle of equal area, but to do the same for an oblique cylinder transcends the powers of elementary geometry; the general solution of this case requires the application of the conic sections, and even curves of a higher order: we have thought proper to mention this, lest some of the readers of THE BUILDER should be led into the supposition of impossible, or at the least very intricate and difficult cases.

The following example will shew the method of applying the above principle of conversion, and since every right-lined figure can be converted into an equivalent rectangle, it will be found that the principle is much more general and extensive than might at first sight be imagined.

Example.—One side of a rectangular parallelogram is twelve feet and the other three feet; what is the radius of the circle which contains an equal area?

Here, then, if we consider the proposed rectangular parallelogram to be the development of a cylindrical surface, of which the length is three, and circumference of the ends twelve feet, its area will be thirty-six square feet, and we have only to find a mean proportional between 3 and 12÷3·1416 for the radius of the circle sought; thus we have $BH = ac = \sqrt{36 \div 3{\cdot}1416} = 3{\cdot}385$ feet, and if a circle be described with this radius, it will have nearly the same area as the given rectangle, or the rectangle may be reduced to an equivalent square by finding a mean proportional between its sides, and then the square may be reduced to a circle of equal area, by reference to a cylinder of which the length is equal to the circumference of its base, precisely in the same manner as in the construction of the figure. Another example may be as follows.

Suppose an architect should find it necessary to convert a square plinth into a cylindrical base of equal solidity and height, what must be the radius of the cylindrical base, the side of the plinth being three feet?

In this case, we have only to find a mean proportional between BG and BG÷π, and the thing is done, for according to the conditions of the question, AB = BG÷π; hence we get,

$BH = aC = \sqrt{9 \div 3{\cdot}1416} = 2{\cdot}865$ feet very nearly, for the radius of the circle sought.

In the next place, let it be required to determine the radius of a circle, of which the area shall be equal to the convex surface of a right cone.

Admitting the rules of mensuration to be known, as in the preceding case, the principles of construction may be investigated in a similar manner. Thus, let AVB, fig. 2, be a right cone, of which AB is the diameter of the base, and AV or BV its slant height, and let the sector, BVD, be the development of the convex surface, obtained by the cone revolving upon itself about the vertex V, which remains fixed; it is therefore required to determine the circle B*m*E, whose area shall be equal to the sector, BVD, or to the conic surface, AVB.

Let the symbols, π, d, and δ denote as before, and let l = AV or BV the slant length of the cone; then the convex surface of the cone is expressed by the term $\frac{1}{2}dl\pi$, and the area of the circle equivalent thereto is $\frac{1}{4}\pi\delta^2$; therefore, by comparison, we get $\frac{1}{4}\pi\delta^2 = \frac{1}{2}dl\pi$; and this, by expunging the common symbol and extracting the square root, becomes

$\frac{1}{2}\delta = \sqrt{\frac{1}{2}dl}$; that is,

the radius or semi-diameter of the circle, of which the area is equal to the convex surface of the cone, is equal to a mean proportional between the radius or semi-diameter of the cone's base and its slant length or height. Hence the following construction:—

Prolong the slant side of the cone VB to G, and make BG equal to BH the radius of the base; then on VG as a diameter, describe the semi-circle V*m*CG whose centre is at F, and at the point B, erect the perpendicular BC to meet the circumference just named in the point C; then is BC the radius or semi-diameter of the circle required; therefore, on C as a centre with the radius CB, describe the circle B*m*E, and it shall be equal in area to the sector BVD, or to the convex surface of the cone AVB.

Since BED the arc of the sector is equal to the circumference of the cone's base, the most correct way of laying it down upon a plane, is to determine the angle BVD, the laying down of an angle being susceptible of greater accuracy than the laying down an arc of a circle, and the method of determining the magnitude of the angle, is simply as follows:—

BV : 180° :: AB : ∠ BVD, the angle sought, which being laid down by a protractor or a scale of chords, will give the sector BVD very correctly. Thus, if the diameter of the cone's base be nine feet, and the slant height fifteen feet, we have 15 : 180° :: 9 : 108°; therefore, if at the vertex V of the cone we make an angle of 108°, it will give the inclination of the line, VD, to BV, the slant side of the cone, from which the sector is readily found.

N.B. A circle equal to the convex surface of an oblique cone cannot be found by the principles of elementary geometry. T.

* In a conversation with Mr. Holtzapffel, the excellent ornamental turner of Long-acre, he admitted that it is possible to construct a cylinder, of which the length shall not differ from the circumference of its ends by more than the thousandth part of an inch; but it is probable that in this estimate he has far underrated his own powers, seeing that the four hundredth part of an inch is distinctly appreciable on the quarter-inch diagonal scale; such is the present advanced state of mechanical manipulation.

SEPULCHRAL MEMORIALS IN ENGLAND.

ON the 31st ult., Mr. W. D. Keyworth, sculptor, read a paper on this subject at the Hull Literary and Philosophical Society. Mr. Keyworth is the modeller to the Yorkshire Architectural Society, and has recently erected a monument in the Holy Trinity Church, Hull, which is well spoken of.

He commenced by referring to the earliest sepulchral memorials in this country, which were mere mounds of earth or stone called barrows; he then alluded to the introduction by the Romans of monumental tablets, some of which might now be seen in the cloisters of Lincoln Cathedral. He then came to the sepulchral memorials found in our churches, none of which could be ascribed to a period anterior to the Norman Conquest, and even from that date up to the reign of Henry III. the number was exceedingly small. It was not common until the 14th century to have inscriptions on these monuments, though there were instances to be found before that time—one in black marble of the daughter of William the Conqueror, for instance, was found in the chapter-house of Lewes. The exact time when effigies first occurred on coffin lids or tombs, was uncertain, but the 11th century was the earliest that could be ascribed to any cumbent effigy. It was about the close of the 12th century that effigies in armour made their appearance. The improvement visible in the arts of design in the 13th century were next dwelt on. The lecturer said:—"The social intercourse of the different European nations during the crusades, contributed very much to the cultivation of literature and the arts. Sculpture and painting had already made their re-appearance in the Republican States of Italy, and itinerant sculptors from that country seem to have traversed Europe in the exercise of their art. It is presumed that they came to this country, for during this century we find a material improvement compared with monuments of an earlier date. In the attitude of some of the monumental effigies of the 13th century, which are supposed to have been done by or after these foreign artists, we find a graceful simplicity, and in the drapery a freedom of arrangement which is not always to be found in the more elaborate and finished productions of a succeeding age. The monumental tombs during the early part and middle of this century were very low, and the sides quite plain; the effigies were also cut like those of the preceding century to fit the coffins, of which they formed the lids. There are some tombs of this description beneath low unornamented arches made within the church wall. These tombs have in general been assigned to the founder of the church, or to some early benefactor. There are some flat slabs which served as coffin lids, and were placed level with the pavement of the church, and are very beautifully sculptured with crosses in relief. This style of sepulchral memorial was very common from the 12th to the 16th century; the most ancient examples are known by the coffin shape of the slab, and the simple form of the cross. In the later examples the slab became of equal width throughout, and they were not used as coffin lids, but merely formed part of the pavement of the church." He exhibited an example of the 13th century from the church of St. Augustine, at Hedon, a very fine specimen of these simple and impressive memorials. Several examples of nearly all periods are to be found amongst the ruins of Thornton Abbey, Lincolnshire. Mr. Keyworth, in reference to the common opinion that the cross-legged effigies of knights, were those of Knights Templars, coincided with the opinion of a writer in the *Archæological Journal* that such was not the case. The lecturer then said, that it was during the reign of Edward I. that the sides of the tombs of persons of rank began to be ornamented with armorial bearings, and small sculptured statues within pedimental canopied recesses, and this style was used until the latter part of the 16th century. The lecturer next proceeded to consider

the sepulchral memorials of the 14th century, a period without its parallel for the beauty and chasteness of its monuments; one of the most beautiful examples of these was the Percy Shrine, at Beverley, which, whether viewed in its noble grandeur as a whole, or examined in its minute particulars, was perfection.

The lecturer said:—"During this period, besides these highly ornamented canopies, we find tombs as in the 13th century, with effigies upon them, but without any architectural detail to distinguish them, except when they are inserted within the walls of a church, when elegant pointed arches, with rich ogee-shaped canopies, were often constructed above them, as in the monument on the south side of the chancel of the Holy Trinity Church, in this town, supposed to be that of William de la Pole. This is a very interesting example, and is almost one of the earliest examples of a monument to a merchant burgess. Near to it are the remains of another monument of the same period, and from what is left of it, we may judge that it has been even more beautiful, and enriched with more architectural detail than that of De la Pole. Mr. Keyworth regretted to say that these valuable, interesting, and only memorials of this period in our own town, are, from neglect and other causes, in a very dilapidated state. The De la Pole monument has been covered with several coats of stone-coloured paint, which has filled up the delicate and rich carving about it, whilst the figures of the venerable merchant and his lady have been daubed very liberally with bronze-coloured paint. The other monument has fared even worse than its neighbour. All the beautiful feathering, as it is called, round the arch has been wilfully broken away, and the tomb and effigy, which he supposed must have existed at first, has been removed to make an entrance from the burial-ground, on the south-side of the chancel into the church. A quantity of brickwork has been erected within the arch of the monument, and the doors fastened to this brickwork, entirely burying all the beautiful architectural detail of this very interesting memorial. It is entirely exposed on the outer-side of the church, to the weather, but has at some time been protected by a chantry, the walls of which remain, although the roof has long since perished. Now that such an interest is taken in the restoration of our beautiful church, it is to be hoped that something will surely be done, if not to restore, at least to preserve from further injury and decay these very interesting monuments. I am not acquainted with the particulars of this last named monument, although I believe it is known whose memorial it is. The armorial bearings on the outer side of it are in such a state of preservation that they may be easily distinguished." The monuments of the fifteenth century were distinguished from those of the fourteenth by a style of composition remarkable for the profusion and display of minute ornament. The monumental brasses and other memorials were then alluded to by the lecturer. The materials commonly used for the monuments of the middle ages were then referred to. The change brought about at the Reformation, and the tasteless and debased character of modern monuments were also spoken of at great length, and the paper concluded as follows:—"In bringing these few and imperfect remarks on the sepulchral memorials of England to a conclusion, I will direct your attention for a short time to the memorials erected in our churchyards or cemeteries, these are of the same character as our monuments. The prevailing taste seems to be for debased Greek and Roman architecture, decorated with urns and sarcophagi, sculls and cross-bones, shovels and mattock, scythes and hour-glasses, every description of emblems are employed but those connected with our Christian faith. In conclusion, we have found in tracing the progress of monumental art from the earliest times down to the Reformation, that the monuments were subservient, and in harmony with the structures in which they were placed; warriors are represented in harness, ecclesiastics in their vestments, civilians in their robes, and females in their ordinary costume, but all of them absorbed in religious meditation and prayer. Since the Reformation down to our own day, our monuments have been of the most debased character as works of art, yet there is now every reason to believe that we are in such matters, on the road to improvement; as the taste for the ecclesiastical architecture of the middle ages becomes more general, and its principles more developed, we trust that the debased character of our monuments will disappear, and give place to a better and purer style of sepulchral memorial."

In an interesting conversation on the subject which followed, the chairman, Mr. C. Frost, remarked, that with respect to the Holy Trinity Church, there was no doubt great foundation for Mr. Keyworth's lamentations at the destruction of several rare works of art. For instance the monument of the De la Poles had been destroyed not only by painting, but by putting on artificial noses of plaster of Paris; no doubt many as well as himself would remember the figures before they were painted, and before these artificial noses were added to them, and he certainly thought them far more worthy objects of attention than they were now; he much preferred them in their dilapidated state than in their present deformed condition. With respect to the monument at the south transept of the church, and which was now the doorway, he was happy to say that it would not be long before that would be restored as far as it was possible.

Mr. Lockwood said, that the monument referred to by Mr. Keyworth (on the authority of Gough) as that of the De la Poles, was, in fact, that of Sir Robert de Selby and his wife. The other monument, the deplorable condition of which he had alluded to, was older than that of the Selbys, and the arms of which shewed it to be the memorial of a Bishop of Mann, who possessed the not very aristocratic or euphonious name of Scroggins. This was to be restored as fully as it could be; the effigy was gone, but the chantry and all remaining of the monument, would now be restored by the churchwardens. The other monument at the south transept was one of the same description as the last; there was a small chantry on the outside of this, which would be also restored. He took the opportunity of stating, that the churchwardens were most anxious, so far as they had the means, that the church should be restored in all its integrity.

REMUNERATION OF ARCHITECTS.

Sir,—No one knows the verity of the facts related in the article in your last number, entitled "Leaves from the Diary of an Architect," better than I do, touching the manner in which the time and talents of the architect are daily fretted away by those would-be friends, who forsooth, have not the smallest atom of compunction in asking his advice upon the practicability of whatever visionary scheme may enter their heads. I venture to say, were the professional man on such occasions to put his hand in his pocket when asked such favours, and offer them a guinea, they would be highly indignant, and consider themselves insulted, yet at the very moment they are consuming his time and talents; but such is man's inconsistency. Professor Hosking's introductory remarks, quoted in your leader, are iron-tongued, and not to be contradicted; they ought to be hung up in the study of every architect, as silent monitors to such inconsistent visitors. It would, indeed, be well, were there to be some plan adopted in the profession as to the charges which he is entitled to, and never until such is the case will matters be otherwise. I am convinced, from experience, that such a system as at present exists is an embargo upon talent, and prevents many from pursuing those studies with that ardour, which is requisite to their advancement in the profession.

But this change cannot be effected unless it emanate from those who have attained a high standing in the profession; let them rectify this crying evil, they have it in their power from their position, and in doing so, they will raise the profession to which they belong, and confer a lasting boon upon their less fortunate brethren. The physician and the lawyer have their fees, and can demand them; put the architect and surveyor in the same position, and not leave his claims as an open question; for so long as such continues, he is almost sure to be occasionally victimized.

I am, Sir, yours, &c., W. S.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

ANTIQUITIES OF COLCHESTER.

At a meeting on Wednesday, the 15th inst., Sir William Betham in the chair, Mr. Bateman exhibited a bronze fibula, found in a barrow at Money Ash, Derbyshire; the peculiarity consists in its being formed of one piece of wire twisted into form; also some arrow heads, from the same county.

Mr. W. Chaffers, jun., forwarded for exhibition, a massive gold ring with intaglio, representing Jupiter seated, holding in the right hand a patera, and in the left a lance, an eagle is by his side; it was taken out of the river, at the time of the pulling down of Old London Bridge.

Mr. E. B. Price sent a drawing of a curious font, lately discovered, built up in the wall of the church of All Saints, at Hastings.

A very interesting paper was read on the Antiquities of Colchester by Mr. C. Roach Smith, in which that gentleman stated the results of his examination of the wall, which extends for nearly two miles round the city; this he considers is of the Roman era, judging from their peculiar method of building, by placing two rows of bonding tiles between every five or six of stone, as well as from the appearance and texture of the tiles and red mortar, which was composed of pounded tiles and lime, becoming in the course of time as hard as the tile itself. The castle he decides to be of later date, as well from the essential difference of the materials employed in the building, as from the architecture. He then proceeded to describe the antiquities which have been brought to light there, among which were, the extraordinary piece of sculpture of a sphinx; fragments of Roman inscriptions; a beautiful bronze of the bearded Bacchus; a small bust of Caligula, another of Jupiter Tonans; a cupid riding on a griffin; also a bronze statuette of a sphinx found a few years since on the same spot as the larger one. He incidentally mentioned, that there was a fine collection of Roman antiquities in the possession of Mrs. Mills, of Lexden, found in that locality.

A discussion ensued upon the different representations of the sphinx among the ancients. In Egypt, it was emblematical of sovereignty, and denoted prudence, and state secrecy, hence Augustus chose it as his seal.

Numerous specimens of ancient ring money in gold, silver, brass, and iron, were laid on the table, and a communication was read by Mr. Croker from Mr. Sainthill, of Cork, on this subject. These rings, according to the theory first promulgated by Sir W. Betham, were used by the Celtæ, as a circulating medium before the use of coins was known, prior to the invasion of Britain by the Romans, and are identical with that mentioned by Julius Cæsar and Tacitus, in their accounts of the ancient Britons. They are semi-circular rings, with cups at each end; immense quantities of them are found in the bogs of Ireland, the uniformity of weight (being the multiples of twelve grains), was an argument in favour of Sir W. Betham's theory; some have been found of gold, weighing fifty-six ounces, indeed, of all weights down to the very minute specimen produced by Mr. Croker, and found by that gentleman in a piece of turf; he also exhibited an iron ring found between the teeth of a skeleton in Ireland.

Mr. Pettigrew stated, that this ring money is observed in paintings and hieroglyphics in Egypt; in one instance, figures are seen weighing them in a pair of scales.

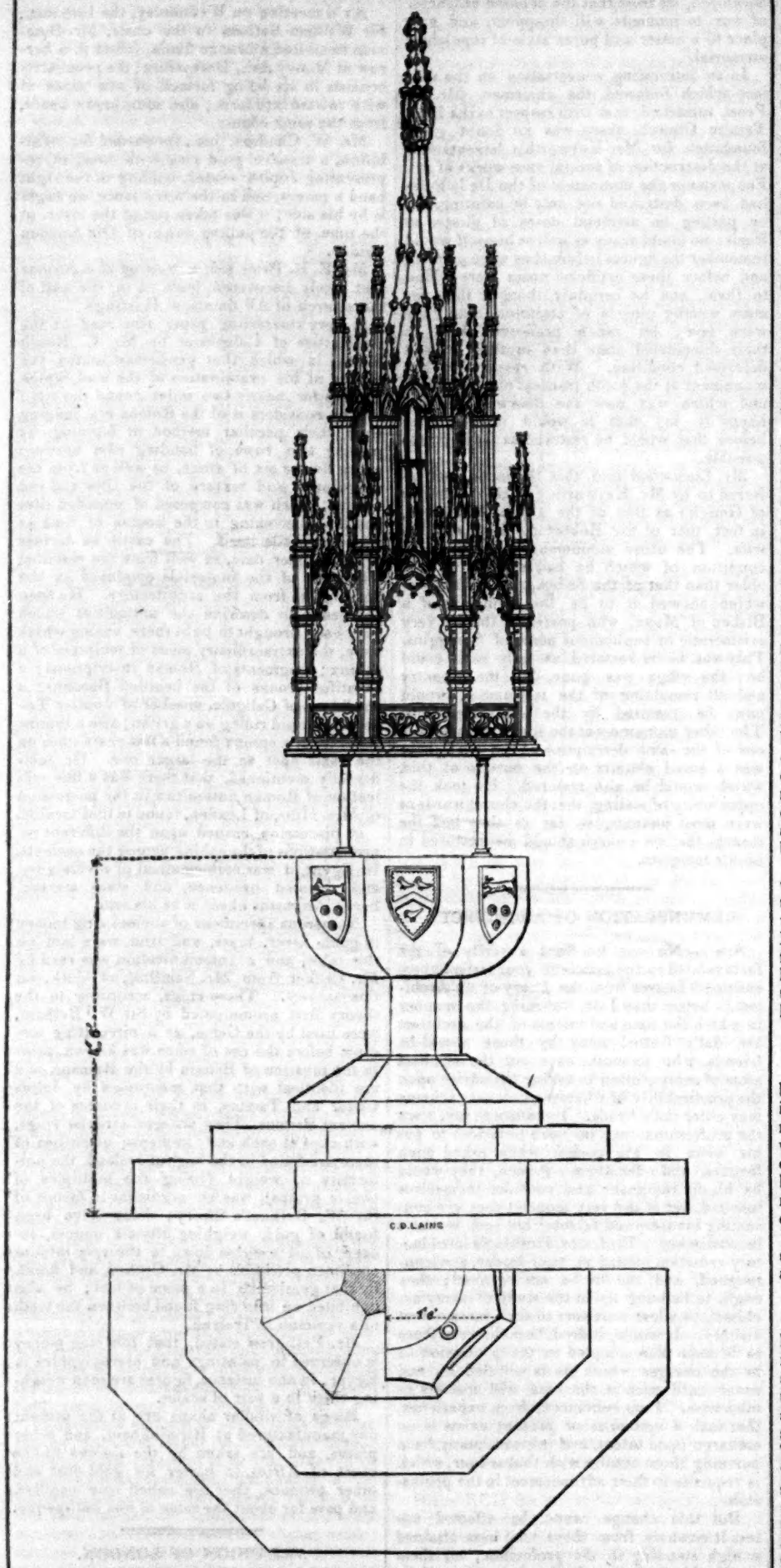
Rings of similar shape are at the present day manufactured at Birmingham, and other places, and are taken by the natives of the coast of Africa, in barter for gold-dust and other produce, they are called iron manillas, and pass for about the value of one half-penny.

ART-UNION OF LONDON.

The general meeting for the distribution of the funds will be held on Tuesday next, in Drury Lane Theatre; the Duke of Cambridge will preside. We shall give in our next number full particulars of the meeting, the report of the Committee in full, and *a list of all the prizeholders*.

A general meeting of artists will be held in Willis's rooms, on Monday evening, to determine on measures in support of Art-Unions.

FONT, CHURCH OF ST. NICHOLAS, NEWCASTLE.



FONT FROM THE CHURCH OF ST. NICHOLAS, NEWCASTLE-ON-TYNE.

The font represented by the accompanying engraving, is in the celebrated church of St. Nicholas, Newcastle. It appears to have been made, or repaired, by Robert Rhodes, the builder of the upper part of the steeple, for his coat of arms with another, probably that of his wife, is sculptured on the basin.* Rhodes was one of the bishop's justices about the year 1486, and was a munificent donor to churches in Newcastle. The lofty cover is of very delicate and curious workmanship.

W. J. N.

Newcastle.

* Brand's "History of Newcastle," 1789.

FISHMONGERS AND POULTERERS' ALMSHOUSES.

Sir,—In The Builder of April 11th, on reading over your leading article, relative to the competition for the Fishmongers and Poulterers' Almshouses, among the many just remarks made, I observe that a set of drawings answering to the description of those sent in by me have been traced; if such is the case, and they prove to be mine, you may rest assured it shall not go unnoticed, and I should be much pleased if every architect whose drawings have been served thus would take similar steps, as I feel satisfied the committee to whose care the drawings were entrusted, are answerable for such conduct, *if or not* it has been done with their sanction.

During my articles I competed for many public buildings for practice, since that time seldom without invitation; in this instance I was invited by one of the committee, a just and honourable gentleman, and who I feel satisfied, as far as lies in his power, will see justice done to all competitors; he is the only person I know even by name, but I trust we may find many like him among the committee, when the result may prove better than expected.

In the year 1837 or 38, I competed for the new Post-office, Manchester, when the following occurred:—After waiting nearly two months from the date of my sending in the drawings (which were a set of studied line and sepia drawings), I called to know the result, and was informed by the secretary that I was not one of the successful competitors, the premium being awarded to the owners of three drawings most elaborately got up, at the same time he offered me a sum for mine, which I at first refused, but finding (by private information) that my drawings had been copied, and fearing expense in trying the case, getting evidence, &c., I abandoned the idea of a lawsuit, and received a sum for the drawings. I left Manchester immediately after, but have since been informed that the building has been executed from them, under the superintendence of another architect; this will shew the nature of competition generally, which has so disgusted me, that I never intend competing again, and I trust many, if not all, of my brother professionals will do likewise.

I must apologize for further intruding, but would feel obliged if you could forward me the name of any gentleman who can recollect the drawing traced, if again laid before him. Business prevented my attending on the days for view, and I did not read your journal of last week until one of my clerks called my attention to the circumstance, when it was too late to write to you in time for the 18th inst.

I am, Sir, &c., W. S. H., architect.

April 20th.

*** Just before going to press, we received a letter from Mr. Recknell, the secretary, terming our observations of the 11th inst. "erroneous and unfair," and promising a reply when the general meeting to receive the report of Committee on plans (held on Thursday last,) was over. We shall be very glad to receive a satisfactory explanation of the extraordinary proceeding to which we referred. We pledge ourselves to the truth of the statement, that a party was engaged in *tracing the plans* during our visit.

Russian and Canadian Timber.—We last week gave an extract from a Government return relating to this subject. Since then, the accuracy of the return has been questioned in the House of Commons by Lord G. Bentinck, and an explanation elicited from the Premier as to the origin of the error, and its extent. The nature of the mistake is, that the prices were necessarily taken from the *Prices Current*, which are not official Customs' documents, but a mercantile list, in which some of the values quoted include the duties, whilst others do not. The heading of the space containing the values—viz., 'value in bond,' led to the error; it applied only to the upper half of the column, not to that part in which these prices were entered; and this distinction was not observed. A new and corrected return will forthwith be presented to the House.

Hawkesbury National Schools.—We noticed several months since the laying the foundation-stone of the above schools. The building is now finished, and was opened last week with great *éclat*. The style is Tudor.

PORCH, ALL SAINTS' CHURCH, STAMFORD.

The annexed engraving is of the tower entrance to All Saints' Church, Stamford; there is another porch on the south side of nave, which is engraved in Parker's "Glossary." It is almost entirely a "third pointed" church, was rebuilt by John Browne, merchant of the staple at Calais, who died in 1442, and was buried in the north aisle.

5, Burwood-place. George Truefitt.

INSTITUTE OF BRITISH ARCHITECTS.

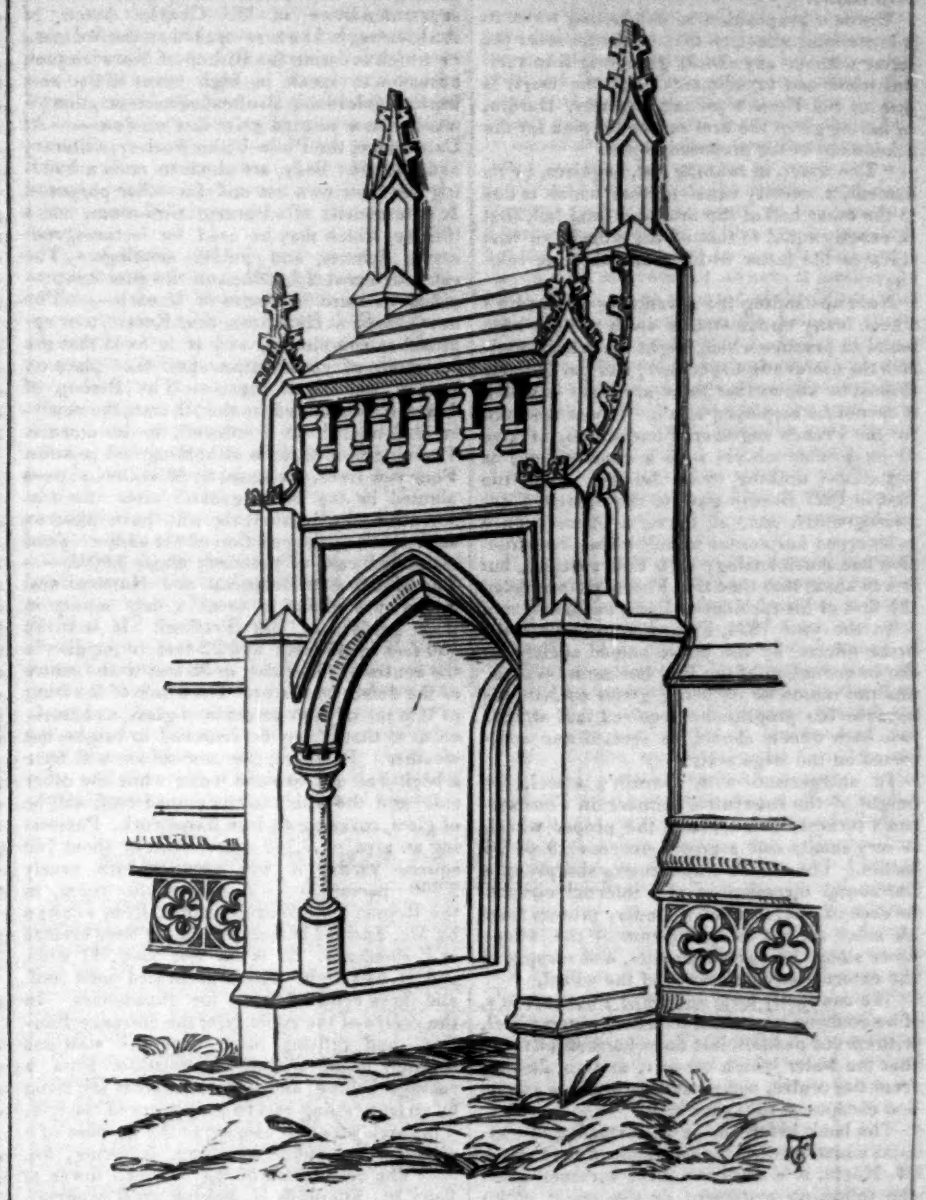
ROYAL MEDAL.

At the ordinary meeting, on Monday evening, Earl de Grey in the chair, several donations were announced; a paper "On the triumphal arches of ancient Rome," by the Rev. Richard Burgess, B.D., was read, and the medals were presented to the authors of the successful essays and drawings. Mr. Donaldson drew the attention of the meeting to the interesting nature of some of the donations. One sent by Mr. Roberts, was a cast from a bust of Sir Robert Smirke, executed in marble by Campbell, and presented to the architect by his pupils. Mr. Donaldson made some remarks in reference to the influence of Sir Robert Smirke, and the theatre at Coventgarden, upon the progress of the art, an influence which had led to many improvements, and the bust was therefore a valuable contribution to the series already in the possession of the institute. Captain Beaufort's work on Karamania was interesting from the plans, which it contained, shewing the sites of the ancient cities in this part of Asia Minor. These plans, he informed the meeting, were made by Mr. Cockerell, who accompanied Captain Beaufort. Amongst the other donations were a piece of marble pavement from a temple in India, a second volume of Gailhabaud's Architecture, and a new work on half timbered houses, by John Clayton, architect.

Mr. Burgess then read an amusing and valuable paper on triumphal arches, in which he noticed the principal examples, and explained the motives of their erection. This paper we shall give at length next week. Lord de Grey, in consigning to the Chevalier Hebeler the medal voted by the Institute to the Chevalier Beuth, passed a high eulogium upon the latter. The Chevalier Beuth presided over an institution at Berlin, united by community of interest and feeling with the Institute of British Architects, to whose members he had on many occasions rendered acts of kindness. The intrinsic value of the medal was nothing, but he hoped that the Chevalier, now about to retire into private life, in order to engage more completely in those pursuits, in which he took interest, would not consider the medal altogether destitute of value, associated, as it was, with feelings, of which no words could convey too warm an expression. The Chevalier Hebeler, in reply, signified the pleasure he felt in receiving this testimonial to the Chevalier Beuth, who had contributed greatly to the improvement of the arts in his country. Lord de Grey then noticed the increasing interest in the Institute, shewn in various communications from foreign societies, a result which he had long since expected, and he felt proud to preside over it. In presenting the medal of the Institute to Mr. Thomas Worthington, of Manchester, for the essay on brick, he expressed the satisfaction which he felt in having the opportunity of giving it; and whatever Mr. Worthington's future objects in life might be, he thought he would never have cause to regret having gained the reward. To Mr. Nicholl, who had gained a medal of merit for an essay on the same subject, he said, that he was glad, as president of the Institute, to present a reward to one, who was a member of the same body; he trusted that the present result would induce him to proceed in the path he had so well commenced;—last year he had covered himself with "slate," and this year he had laid a good foundation of "brick." To Mr. Wadmore, he presented a medal for the best design for a royal chapel, repeating that the value of the medal consisted in the fact of having gained it, and saying, that he hoped in some future year, when Mr. Wadmore discovered the medal of the Institute in some forgotten drawer, he would look with pleasure to the occasion on which he had received it.

Lord de Grey then gave the announcement, to which allusion was made in the last number of The Builder. He said, that some time ago, it had been suggested to him, that if application could be made to the Queen, her Majesty might be graciously pleased to offer a medal herself, and that this would be an extraordinary stimulus to the members of the institute. He had not, at that time, felt able to say how far such a result might be expected, but the subject had since been mentioned to her Majesty, and he was now happy to say that her Majesty's acquiescence was instantaneous. He had only made the communication to the proper party, on a Saturday, and on the Tuesday following, he was informed, that her Majesty would give an annual medal for the best essay or design, as might be agreed upon. He did not know whether he was doing any thing not warranted by the written rules, but he was at least sure, that he should receive the concurrence of every member in proposing, that the cordial and hearty thanks of the Institute be forwarded by him, through Mr. Anson, to her Majesty, without another day's delay. The details would be considered by the council; he presumed that the Institute prizes would be competed for as usual, on the 31st of December, and they would therefore have abundant time to prepare. He felt much pleasure that he had been instrumental in obtaining this, and he should be happy, if under any circumstances, he should be present next year, when her Majesty's medal would be conferred. After a vote of thanks, the meeting adjourned to the 11th of May.

PORCH, ALL SAINTS' CHURCH, STAMFORD.



ON HORIZONTAL WATER-WHEELS, ESPECIALLY TURBINES.*

The nature and importance of the submerged horizontal water-wheel, invented in France a short time before 1827, and called a *turbine*, having excited attention, Sir Robert Kane has been led to translate Rühlman's memoir of it, and to convert all his rules and formulæ for calculation. Euler's mill is generally understood. "A perpendicular cylinder, or any similar hollow body, filled with water, and free to turn on its axis, bears on every point of its sides a pressure outwards, which tends to impel the vessel in its own direction, but can produce no motion if the side is strong enough to withstand it, because the point of the cylinder lying diametrically opposite experiences a similar pressure. If we make an opening in one part of the side, and apply to it a tube, which is directed at right angles to the axis of the cylinder, the pressure ceases there, from the water finding vent, but that on the diametrically opposite part remains, and produces a circular motion of the vessel, which is in a contrary direction from that which the water flowing out horizontally assumes. Professor Seyner, in Gottingen, pointed out the application of this principle to driving millstones, and Barker, an Englishman, practically executed similar constructions."

"Almost identical in theory with the abovementioned wheels are those in which the wheel forms a drum, shaped like a cone truncated parallel to the base, with its wider end uppermost, and bearing spiral float-boards on its surface; an inclosed space surrounds the wheel

* From the German of Moritz-Rühlman. Edited by Sir Robert Kane. Hodges and Smith, Dublin, 1845.

concentrically; and when the water, entering the case from above, runs down along the windings of the spiral, it compels the wheel to turn round.

Borda's proposition of conducting water to a horizontal wheel, so that it should meet the latter without any shock, gave origin to various trials and experiments; but the merit is due to the French mining engineer, Burdin, of having given the first successful plan for the attainment of the proposed object."

"The water, in running out, acquires, by its descent, a velocity equal to that which is due to the other half of the available total fall, that is, exactly equal to that of the wheel; so that it leaves the latter without any absolute velocity.

Notwithstanding the advantages of Burdin's wheel, many circumstances seem to have been found in practice which might materially diminish the useful effect specified; and particularly it must be known that there are cases in which it cannot be employed at all. It was reserved for the French engineer, Fourneyron, to give to horizontal wheels such a construction, as left almost nothing to be desired. It is true that in 1827 Burdin gave to the Societé d'Encouragement, &c., at Paris, a memoir on a submerged horizontal wheel, whose construction had much analogy with Fourneyron's, but it was about that time that Fourneyron erected the first of his turbines at Pont, on the Ognon.

In the year 1834, Fourneyron received the prize offered by the above named society for the construction of the best horizontal wheels, and the reason of its being given so late was because the programme required that at least two such wheels should be erected and completed on the large scale.

In comparison with Burdin's wheel, the height of the concentric cylinder in Fourneyron's turbine, which forms the proper wheel, is very small, and scarcely exceeds 10 or 15 inches. The motive water enters sharply in a horizontal direction at the internal circumference of the vertical cylinder, presses from all sides on the compartments of the wheel, flows along the curved paddles, and escapes at the external circumference of the wheel.

We can easily form an idea of Fourneyron's, if we conceive an ordinary vertical water-wheel, with curved paddles, laid down horizontally, and that the water which gives it motion, flowing from the centre, enters at the internal circle, and escapes at the outer side."

The book before us is illustrated, and contains a mathematical examination of the theory. M. Morin, in a work on these turbines, gives the following statement as the result of his experiments:—

"1. That the wheels are applicable equally to great and to small falls of water.

2. That they transmit a useful effect, equal to from 70 to 78 per cent. of the absolute total moving force.

3. That they may work at very different velocities, above or below that corresponding to the maximum effect, without the useful effect varying materially from that maximum.

4. That they may work from one to two yards deep under water, without the proportion which the useful effect bears to the total force being sensibly diminished.

5. In consequence of the last preceding property, they utilize at all times the greatest possible proportion of power, as they may be placed below the lowest levels to which the water surface sinks.

6. That they may receive very variable quantities of water without the relation of the useful effect to the force expended being materially lessened."

All who are interested in the economy of water power, and the construction of machines best adapted for obtaining it, should examine into the subject-matter of the volume before us.

ELECTROPHONIC TELEGRAPH.—Professor Jacob, of the Imperial Academy, St. Petersburgh, has just communicated to that body the invention of an electrophonic telegraph, composed of ten keys, ten different accords, and ten conducting wires, by which the letters of the alphabet and words can be expressed by means of sounds. The academy has pronounced a favourable opinion of the invention.

HEREFORD CATHEDRAL.—The eastern portion of the choir of this cathedral is about to be restored under the superintendence of Messrs. Cottingham and Son.

NOTES IN THE PROVINCES.

GRIMSTON Church, Norfolk, has recently undergone very extensive repairs, under the superintendence of Mr. Charles Ayton, of Attleborough. It was re-opened on the 3rd inst., on which occasion the Bishop of Norwich took occasion to speak in high terms of the new works; his lordship also headed a subscription towards a new painted glass east window.——At Cambridge, the Philo-Union Society, a literary and scientific body, are about to erect a building for their own use and for other purposes. It is to consist of a library, club-room, and a theatre, which may be used for lectures, concerts, debates, and public meetings. The estimated cost is 5,000*l.*, and this sum it is proposed to raise in shares of 5*l.* each.——The new church at Heavitree, near Exeter, now approaches completion, and it is fixed that the ceremony of consecration shall take place on Friday, the 5th of June.——The Bishop of Lincoln consecrated, on the 7th inst., the newly-erected church at Southwell, in his diocese. The church is capable of holding 650 persons. Four yew trees, presented by Miss Cooke, were planted in the burial-ground after the consecration, by individuals who have taken an active part in the erection of the edifice. Total estimated cost of erection, about 3,000*l.*——The Manchester Botanical and Horticultural Society are about to erect a new saloon in their gardens at Old Trafford. It is to be 150 feet by 45 feet; and 22 feet in height to the centre of the dome, or 32 feet to the centre of the dome ventilator. The whole of the front of this saloon is to be made of glass, and moveable, so that it may be removed in bright, hot weather. In short, the new saloon will have a back wall and two end walls, while the other side, and the whole of the domed roof, will be of glass, covering an iron framework. Possessing an area of 6,750 square feet, or about 740 square yards; it will accommodate nearly 2,000 persons.—— A new public room, in the Roman style of architecture, from a design by Mr. Edward Welch, has lately been erected at Birkenhead. It is 46 feet long, 30 wide, and 21 feet high, with a decorated open roof, and three centre flowers for chandeliers. In the centre of the room, over the entrance doorway, and retiring back over the staircase landing, is an orchestra, accessible from a passage behind, and separated from the room by an iron railing cast to the pattern of the lyre. This orchestra will also serve the purpose of a platform for public speaking, lecturing, &c. —— The restoration of the Norman tower at Bury St. Edmunds is making great progress. The walls have been taken down 12 feet all round, to the spring of the upper tier of arches, and at the south-east angle 25 feet of the ashlar or stone casing has been removed and replaced, large masses of the rubble core having also been cut out at the fissures and decayed places, and the cavities filled up with solid grouting. The second tier of arches have been turned afresh with some new keystones, but generally speaking the identical stones have been replaced as nearly as possible in their former situations, so that, we learn, the work exhibits scarcely a sign (except its restored regularity) of a hand having been recently applied to it.——At the current Dorset Quarter Sessions, the Marquis of Westminster brought forward a motion on the subject of prison discipline, involving alterations in the county gaol to the cost of 9,000*l.* The motion was unanimously affirmed.—— The county surveyor of Wilts has received instructions from the bench of magistrates to prepare a plan and estimate of a new police station-house, including a magistrates room for holding petty sessions, accommodation for the lodging of a superintendent and policeman, stables, &c. The same to be erected at Swindon.——At the Essex Quarter Sessions, held last week, a committee of fifteen magistrates was appointed to superintend the erection of a county lunatic asylum. Whether the proposed asylum shall be solely for the county of Essex depends upon circumstances. The committee have the power to negotiate with the magistrates of a neighbouring county, and to make preliminary arrangements for the erection of one asylum sufficiently large for the lunatics of both counties. The Act of Parliament does not require that the building should be commenced for three years, but at the end of this term, if not begun, the Secretary of State can step in and build it at the expense of the county.——The foundation-stone of a subscription church at Preston will be laid at Whitsuntide. The *Preston Chronicle* says:—"We have seen a plan of the building, through the kindness of our townsman, Mr. Latham, architect, and we need only say that it reflects infinite credit upon him, and that the church will be an ornament to the neighbourhood in which it will be erected.——An Independent chapel, from a design of Mr. W. Stuckey, is being erected at Langford. It will be a Gothic structure, and have two octagonal towers in front. The cost is estimated at 500*l.*, and it will be capable of accommodating about 300 persons.——The restoration of Eton College Chapel, including the enlarging of the choir, the erection of Gothic stalls, and a new screen, &c., is to be proceeded with immediately. The cost is estimated at from 10,000*l.* to 12,000*l.* A new burial-ground, in connection with the college, extending over about an acre of land on the Eton-wick Road, and within 500 yards of the college chapel, was consecrated on Thursday week by the Bishop of Lincoln.——Some misunderstanding has arisen between Mr. Hakewill and the restoration committee of St. Nicholas's Church, Yarmouth. Mr. Hakewill proposes to remove the brickwork inside two arches, which he contends is both useless and unsightly. The committee, bringing little or no knowledge to bear upon the subject, oppose their ignorance to the architect's science; they are timid, and think the safety of the fabric may be endangered. Tenders for the several works will be advertised for immediately. The estimated cost of the restoration is 5,000*l.*——At Liverpool a large "home" is being built by public subscription as a lodging-house for sailors, annexed to which will be a "refuge" for that meritorious class. The subject of the improvement of the port of Colchester having been referred to the Admiralty for their assent, in compliance with the standing orders of the House of Commons, their lordships have appointed Captain Washington, R.N., one of the Tidal Harbour Commissioners, and Captain Vetch, Royal Engineer, to inspect the river, and report on the proposed plan.

FREEMASONS OF THE CHURCH.

THE VERONESE MISSAL.—EGYPT.

APRIL 14.—The Rev. G. Pocock, L.L.B., in the chair. The Right Hon. the Earl Cadogan submitted specimens of Greek glass in illustration of the Portland Vase. Mr. George Isaacs presented an old English manuscript and seal, of a grant of land in Cumberland of the time of Henry VIII.; and exhibited several abbey seals in Bucks, dating between the 12th and 13th centuries. Mr. Weale exhibited 70 plates of stained glass and painted glass, 60 of which were highly coloured; they were of the age of Albert Durer.

The celebrated missal executed by Francesco and Girolamo Veronese, was exhibited by Mr. Jarman, upon which Mr. W. H. Rogers, the illuminator to the Society, read a description, tracing the history and pointing out the characteristics of this volume. The enthusiastic account given of it by Dibdin in his "Decameron" was referred to, and quotations made from it with explanatory comments. The arms, which occur in several places, are those either of Pope Sixtus IV., or Julius II., while Cardinal, from which it may be inferred that the illuminations were executed in the latter half of the 15th century. It was commenced by Francesco, and finished by his son Girolamo, the instructor of Julio Clovio. The former held a high and well-deserved position in fame among the Italians of his time, who bestowed on him the title of *Francesco da i libri*, to the assumption of which modern criticism would willingly allow his prerogative. He has sketched with a fine pen in outline, not only miniatures of the most exquisite character, illustrative of important subjects in the Roman Missal, but he has encircled them with arabesque borders of such extraordinary conception, that one is astonished at the fact of a single mind being able to produce combinations so varied, but all so truly magnificent. Subjects from the sacred text are sometimes combined with the ornament of which they form a part—a principle of design not uncommon in the 16th century, but of which Mr. Rogers considers this the earliest specimen. The

principle of Francesco's colouring was entered into, and contrasted with that of his son, the former being invariably a union of wash and stipple, and the latter entirely body-colour. An arabesque design had been enlarged from one of Francesco's, and exemplified on an intelligible scale, the style of his composition. Dolphins, boys, masks, gems, flowers, and monsters were subservient to his will, and grouped with a degree of unity which many in the present age may in vain strive to emulate.

A proof engraving of one of the miniatures was exhibited. Upon this, as upon many others, the artist had inscribed his name, a circumstance of such rare occurrence in other MSS. that the names of few more of the great illuminators of Italy are known to us than those rescued from oblivion by Vasari. A singular feature in this artist's works is the appearance of a number of short inscriptions in various parts of the ornament. They have not been explained, and were probably mere types of private vanity. The finest of the miniatures by Girolamo were pointed out among them; one containing a half-length portrait of the Pope, another of St. Gregory, behind whom his holiness is kneeling, with an attendant bearing the tiara; and the last, which is very remarkable, as representing the payment of a large basin of coin for the execution of the volume.

Mr. George Russell French, architect, then read a lecture on Egypt, in which that country was considered chiefly in its relation with the Hebrew nation. After alluding to the different names by which Egypt, "the black country," was known, both in scripture and profane history, the lecturer quoted the instance of Abraham's going down into Egypt when a famine arose in Canaan, and the arrival of Joseph, followed by that of his father and family, their establishment in Goshen, and the subsequent ill-treatment of their descendants by the king, "which knew not Joseph." He then endeavoured to shew that this king was one of the race of the Hycsos, or shepherd-kings, a dynasty which had usurped the throne of the ancient Pharaohs, and under whom probably the native Egyptians were compelled to work in bondage as well as the Israelites—an opinion countenanced as well by the command of Moses, "Thou shalt not abhor an Egyptian, because thou wast a stranger in his land," or by other collateral evidence. The assertion of Josephus, that the Israelites were employed on the Pyramids, was then discussed, and among the illustrations in support of this declaration, the well-known account in Herodotus, of the money expended on vegetables for the workmen, was compared with the avowed longing of the Israelites for the very same vegetables after their Exodus. Upon some of the monuments of Egypt, among the persons engaged in the drudgery of making bricks, men are depicted wearing beards working with the native Egyptians; and as the latter shaved their heads, it is conjectured that the Hebrews are intended by the bearded parties. The absence of hieroglyphics in the interior of the Pyramids, the absolute and unusual plainness of the sarcophagi placed therein, and these last again found empty, point to a very early period of erection, either before the invention of hieroglyphics (which was Belzoni's opinion), or to the refusal of the sacred scribes to record the deeds of the founders, which would be easily accounted for if we can refer the building of the Pyramids to the shepherd-kings (which is Lord Lindsay's belief). Even if not engaged upon the great stone Pyramids of Gizeh, the Hebrews may have assisted in building the *brick* Pyramids at Dashoor, Saccarah, and elsewhere.

Notice was taken of some of the miracles of Moses before Pharaoh; and, in allusion to the turning of the waters of the Nile into blood, the opinion of travellers was quoted as to the great sweetness of the waters; and, probably, Jeremiah alluded to this delicious quality when he speaks of "the waters of Sihor" (2 v. 18). The river being worshipped as a god, called ὄθος on the great Sphinx, and, in fact, every thing to the Egyptians, or as Achilles Tatius expresses it, "both river, and land, and sea, and haven;" and that people affecting great cleanliness and dislike to blood, the pollution of their sacred stream must have been a terrible infliction.

The rising of the Nile was then accounted for, and an apposite illustration quoted from Shakspeare of the measured standard by which it was usual to ascertain the height of the waters, the great poet with admirable judgment, selecting a pyramid rather than a column, as he was writing of the days of Cleopatra, and the famous nilometer was not erected till the year 820, A.D. One state of things was consequent upon another in a country like Egypt; the inundations of the Nile rendered it necessary that the burial places should be raised above their reach, and the necessity of keeping the bodies unburied for some time, brought embalming into use, of which the first recorded instance was for the partriarch Jacob.

The idolatries of the Egyptians were glanced at, especially those which influenced the Israelites, as the setting up of the golden calf, a copy of apis, at Mount Horeb, in later times repeated by Jeroboam at Dan and Bethel, his two golden heifers being imitations of the bull apis adored at Memphis, and the bull Mnevis worshipped at Heliopolis. Ezekiel's vision when he saw the seventy elders (or Sanhedrim) offering incense in the dark chamber of the temple, on the walls of which "all the idols of the house of Israel were portrayed," agrees exactly with the representations in Egyptian temples and tombs. The calamities which came upon Egypt were doubtless, as well for her monstrous idolatries as for her injurious treatment of the Israelites subsequent to their Exodus, and the predictions of the prophets that Egypt should be "the basest of kingdoms," and that there should be "no more a prince of the land of Egypt," have been completely verified in the conquest of the country by successive nations for twenty-four centuries, until it is at this moment suffering under the stern and iron rule of Mehemet Ali, the most cruel despot that Egypt has hitherto known.

SPANISH ARCHITECTURE.*

The branch of our subject which we now approach, as it is spread over ten centuries, embraces many changes; and may be divided into the beginnings of the dispersed Goths; the round-arched Romanesque; the different stages of the pointed style; the revival or Cinque Cento; the Classical; and the decline, first into meretricious ornament, and then through the *Rococo* to the present academical and death. Thus Spanish architecture has followed the monarchy from its cradle, waxing strong with its growth, splendid in its manhood, and feeble with its decay. Spaniards, when writing on what we still call *Gothic* architecture qualify that epithet, which is alike false in its historical as in its secondary and vituperative signification. Descendants of the mighty Goths, the prostrators of Rome, that name is looked up to by them as the fountain of honour, not disgrace. In Spain, as elsewhere, it cannot exactly be said by whom the pointed style was invented, or when it was first introduced; the form itself must long have been obvious, since it is perfectly produced by the lines which divide every one of the then common series of intersecting round arches, of which it is but a development; nor in all probability was its first adopter aware of the mighty capabilities which this germ contained, as the acorn does the oak. The Spaniards, assuming that it was first used in Germany, and by Charlemagne, term the pointed style, Gothico *Tedesco* and *Germanico*. Be its inventors who they may, it certainly did not originate with the Spanish Goths, whose existence had ceased some five centuries before its appearance; nor does it deserve the stigma which has been cast on it by classicists and academicians. This style, at once original and Christian—unadulterated by those associations of Jupiter and Juno, which infect the walls of every antique elevation—was created for a new and purer religion; hence the rapidity with which it spread simultaneously over most of Christendom, attaining in Spain a glory which one day will be properly appreciated. There it creeps, not along the ground, like the horizontal line of the Pagan temple—nor the low-roofed mosque of the Moslem, of earth earthy, like their creed—but aspires on high, ascending with the prayers of those who worship within, to whom alone the privilege of looking up to heaven and a future has been vouchsafed. And how lovely is this Christian style in itself—how perfect in its own rules, orders, and proportions—how inexhaustible in its resources and varieties of combination—how full of meaning, intention and capability—how significant its cruciform plan, its perpendicular spires—how rich in mystic symbols, being itself a symbol of the Infinite—how profound the religious awe—how innate the devotional sentiment, yet how true the artistic feeling and poetry—how boundless the scope in elevation, construction, and decoration, for individual mind and genius to work and expand itself, with which the limited and fixed classical system never could or can compete. There indeed the lust of the eye is gratified, but the Christian heart is not touched—nay, cloyed with sameness of sweets, it loathes the honeycomb. The remnant of the Goths, who fled before the Moors into the Asturian caves, to temples not raised by hands, had to struggle for mere existence; their architectural progress was that of an army which first bivouacs, then runs up huts, and when the ground is cleared of foes, builds barracks and citadels. More than a hundred years elapsed before their earliest works were erected, which date from the ninth century, and are correctly called by Spaniards *Obras de los Godos*, works of the Goths, not Gothic works."

"The characteristics of this Spanish Romanesque or corrupted Roman manner, are the portico, useful in the damp Asturias, a massy masonry, the round arch, solid piers, and want of height. The style in less than a couple of centuries was improved by a northern element, which was brought into Catalonia by the Normans, who aided the Christians against the Moors, and who settled in reconquered districts; it soon spread into the Castiles, and particularly in the eleventh century, under Alonzo VI., whose wife was a French princess—whose primate was a monk of Cluny—whose son-in-law, Ramon, was a Burgundian, and brother to Pope Calixtus II. Foreign creeds and fashions were the natural result; and we find, in 1060, Petres de Tamber, a German, rebuilding the cathedral of Leon; while in 1090 Ramon was employing, on his new works at Avilla, Casandro, a Roman, and Florin, a Burgundian. Again, in 1118, the Norman prelate, Oldegar, commenced the stately cathedral of Tarragona, a city wrested from the infidel by his countryman, Robert Burdet, a 'warrior,' as his Norse name implies. About the same time, Geronimo, a native of Perigueux, and bishop of the Cid, took peaceably, after his pugnacious patron's decease, to church-building, and erected the castle-cathedrals of Zamora and Salamanca. Thus the Normans in Spain emulated their contemporary countrymen in France, England, Sicily, and Apulia. Their style was also propagated by the Templars, who, numerous and powerful in the Peninsula, maintained a close freemasonry with their tramontane brethren: the collegiate church at Toro, the Magdalen at Zamora, and the church at Mansanara, near Aviles, are fine specimens of Templar architecture. The prevailing characteristic is simple solidity. The masonry was too robust, too thick to require buttresses; and as forays and invasions were then rife, the churches were built, like those in Syria, both for prayer and defence—hence the smallness of windows which weaken walls, and the size of towers, which offered refuge keeps. The windows are round-headed, and often divided by a single pillar, without mullions or transoms, and exactly the *Ajimez* of the Moors. Among ornaments, the chevron and billet-moulding occur frequently. The transition from the round arch to the pointed one was gradual, and the two may be seen in juxtaposition in the nunnery of *Las Huelgas* near Burgos, which was founded in 1180 by Leonora, daughter of our Henry II., and wife of Alonzo VIII. This now degraded pile is an architectural encyclopedia, in which the horse-shoe arch intermingles with round and pointed ones, and Gothic crocket-work with Saracenic dispery. The windows now become wider and more elegant—the buttresses, finials, and external supports richer."

"The civil wars which ensued after the death of St. Ferdinand blighted these blossoms of piety, and filled the land with poverty and crime. Now castles were raised instead of convents—some of which yet remain, shorn, like aged oaks, of their leaves and branches. The Spaniards, who previously had made use

* From the "Quarterly."—Continued from p. 173, *ante*.

of Moorish fortresses, now that they began to build for themselves, abandoned the Oriental form and material, to adopt those of the Romans and Goths."

"The private dwellings of Spanish kings and nobles down to Charles V. were chiefly Moorish, and artisans of that nation were employed in most works of luxury and ornament. Few of the ancient capitals are without a royal palace. Of these the most interesting examples are the Alhambra, the Alcaiseria at Zaragoza, the Alcazares of Seville and Segovia; and of private houses, those of the Alba and the Casa de Pilatus at Seville.

The bridges built by the Moors were narrow, and high pitched in the arch, being destined more for horse and foot passengers than carriages; fine specimens exist near Martorell and at Toledo. The Spaniards here again, as in their castles, adopted a Roman model, of which such noble ones remain at Merida, Salamanca, and Alcantara. Among the best imitations is that thrown over the Ebro, near Logroño, in 1107, by Juan de Ortega; those over the Miño at Lugo and Orense; and others near the cities of Santiago and Zaragoza, the Mecca and Medina of the Peninsula: indeed, the early bridges, roads, and hospitals, were chiefly constructed to facilitate the progress of pilgrims. In later times primates and prelates were true pontifices maximi: witness those grand works that span the Tagus at Talavera, and at the Puente del *Arzobispo*, which denotes its founder Archbishop Tenorio, as that lower down, *del Cardenal*, does its author Cardinal Carvajal. The subsequent ones were the work of the state. Thus Philip II. built those at Simancas, Badajoz, and Madrid; Charles III. that of Alcoles, near Cordova, which, like one at neighbouring Ronda, is superb, both in conception and execution.

To return to Gothic architecture: once established in Spain, it advanced as steadily as the classical had done, where the rude Tuscan preceded the chaste Doric and the elegant Ionic—and thence expanded into the beautiful Corinthian and ornate Composite. The fourteenth century—the age in England of our valorous Edward III. and of William of Wykeham—in the Peninsula was that of the gallant Alonzo XI. and Archbishop Tenorio. The most successful among native architects were Jayme Fabra, Juan Franck, Alonzo Martinez, and Juan Alfonzo: the finest examples of this glorious period will be found in the exquisite Cathedral of Leon, the St. Ouen of the Peninsula—in the elegant ones of Palencia, 1321—and Oviedo, 1388—the solemn Seu and Sa. Maria del Mar at Barcelona, 1328—the Seu of Zaragoza—and the convents of Lupiana, near Guadalajara, 1330—and Guadalupe, 1389. The *Transito*, or Jewish synagogue of Toledo, 1350, is without rival in the world, and presents a matchless ensemble of all that Hebrew and Gothic and Moorish art could do in juxtaposition.

The fifteenth century witnessed the full-blown development of the Spanish Gothic, which now luxuriated in storied windows richly dight, in high embowered roofs, in heraldic pomp, and in a lacework embroidery of decoration thrown over walls and ceilings. This—the period of our Waynfleet, Chichele, and Henry VII.—found more than a parallel in Juan II., the Mæcenas of the troubadour, in Ferdinand and Isabella, and their great cardinals, Mendoza and Ximenez: who, like their predecessors and successors in the primacy of Toledo, were among the noblest patrons of learning and art that any country or age has ever produced. Then arose those cathedrals and colleges whose founders may well smile from their graves upon the magnificence of moderns. These colossal and costly monuments, raised in days of poverty, shame the carpenters' Gothic of this iron age of money-changers and millocrats. Now the gift of half an acre for a site from one who owns half a country is trumpeted forth as munificent;—if any thing really noble be done, it is treated as a sort of symptom of madness! In those times no wonder was excited when Christian men, or Christian women either, offered the fruits of self-denial on the altar. Very many, frugal at home like the older Romans, like them reserved their magnificence for the 'Palace of God.' Now private luxury and domestic decoration contrast with religious poverty in art and meanness in feeling; nay, the Gothic devotional sentiment has almost become too mysterious to be comprehended in 'modern contracts to be finished in eighteen months.' Centuries then elapsed during the erection of the temple; the completion was handed down from one generation to another as a sacred duty; the church, built on a rock and like one, rose as if to endure for ever. Nor was expense of gold or thought ever grudged on this labour of love. The founders did not sit down to build a tower without mature consultation—nay, frequently, in cases of difficulty, juries of the most eminent architects were summoned to decide on plans which had been prepared by numerous competitors. Although one general principle pervades all the cathedrals of Spain, a difference is perceptible in the provinces, many of which were once independent kingdoms: the sister piles retain a family likeness, without being identically the same, insomuch that Spanish architecture has its provincialisms—like the dialects, manners, and customs of the different parts of the Peninsula, which are so marked as to afford certain geographical tests.

WESTMINSTER COURT OF SEWERS.

On Friday, the 17th inst., a court was held; Mr. Leslie was chosen chairman. The clerk presented the treasurer's book, by which it appeared, that the cash balance at the bankers was 10,620*l.* 17s. 9d. In consequence of a communication from the solicitors of the court relating to the Highways Bill, some additions were suggested to various clauses, and an application was ordered to Sir James Graham requesting the additions to be made.

The Vauxhall Bridge Company appealed against the rate, alleging that they did not consider themselves liable. The court thought otherwise, and ordered the collector to apply for a warrant at the next court, if the rate were not paid before.

Mr. W. Tooke, the solicitor to the Institution of Civil Engineers, in Great George-street, Westminster, appealed against the rate upon a part of the institution occupied by the secretary, alleging that the property was exempted by the 6 & 7 Vict., cap. 36. It appeared that the property was leasehold, and the Civil Engineers' Institution covenanted to pay the landlord's taxes, among which sewers' rates were named. The appeal was deferred for a month, and on the motion of Mr. Le Breton, seconded by Mr. William Donaldson, the opinion of the Solicitor-general was ordered to be taken as to the liability of the institution to sewer's rates; the draft case to be presented to the next court.

On the applications of various parties, 3,450 feet of the new forms of sewers were granted, and 98 drains. A special clerk of the works was appointed, to see that the applicants strictly obeyed the orders of court, by making the sewers in the best possible manner as to materials and workmanship.

The following accounts were presented to the court as having been examined and passed by the committee of accounts:—

Commissioners' fees, quarter ending Lady-day	£65	4	0
Petty cash, quarter ending Lady-day	140	4	2
Bricklayers' and labourers' wages from the 25th December, 1845, to 27th March, 1846	458	1	2
	£663	9	4

A long discussion took place on a proposition to invest 5,000*l.* of the balance at the bankers in exchequer bills; the profit and loss on such purchase to be calculated and distributed over the districts at the end of the year. The arguments against the proposition were, that the rates having been made much too high, and the expenditure much reduced, occasioned the heavy balance, and was a temporary evil; and the difficulties of calculating the proportions of profit and loss appearing almost insurmountable, the proposition was negatived by ten to four.

An important motion was then disposed of, viz., to rescind an order of court of the 20th February last, limiting the extent of No. 3 sewer to 100 feet. Mr. Cumberlege and Mr. Mayhew both detailed numbers of courts and alleys, where at present no sewer or drain exists, all of which were of a greater length than 100 feet. The order was unanimously rescinded. It was understood that the surveyor should direct his attention to these confined localities, and present a plan by which they might be cheaply and effectually drained. Adjourned to Friday, 1st of May.

SOCIETY OF ARTS.

April 15th.—Mr. Thomas Webster, M.A., vice-president, in the chair. The first communication was on Mr. Rand's inventions for the manufacture of flexible metal vessels, for preserving paint and other matters, by Mr. Carpmael.

Mr. Carpmael stated, that Mr. Rand, who is an artist, had, from the inconvenience and waste of colour which takes place when it is put up in the bladders ordinarily used for that purpose, been led to endeavour to find a substitute, and the use of metallic vessels suggested itself to his mind. After many experiments, he succeeded in forming them of so thin a body of metal, that they are capable of being collapsed so as to shut out all air. The tubes are made of block-tin, the 150th part of an inch in thickness, and have at the upper end a nozel and screw-cap, and are closed at the bottom by being folded over once or twice with a pair of pinchers, so as to exclude all air. As the colour or other matter which they contain is pressed out, the tubes are collapsed, and thus the upper part of the tube always remains full. Each tube has to go through the following process of manufacture:—A small piece of block-tin is put into a dye, upon which a punch, worked by a fly press, descends and forces the metal up of the required thickness between the surfaces of the dye and punch; thus by a single blow the body of the tube is formed. It is then removed to a second press, by which the screw on the neck of the tube is formed, and by a second blow in the same press the maker's name is stamped upon it. The cap is formed in a similar manner by a third machine. The tube, when struck, is placed in a lathe, and cut the required length. Thus a perfectly air-tight bottle is formed without seam in a few seconds.

Mr. Wright exhibited a number of the tubes, which were beautifully ornamented, some of them being covered with richly embossed velvet and other materials, and filled with choice perfumes; he presented one of the bottles to every lady present.

He also stated that he had exported to various parts of the world, essence of anchovies, prepared mustard, cold creams, volatile chemical preparations; it is also intended to export and import butter, preserved meats, and other substances, in cases of this description.

The second communication was by Mr. Banks on the cotton produced in Honduras and Yucatan, and the practicability of introducing free labour cotton from Africa and other countries into the British market.

VELOCITY OF FLOWING WATER.

Sir,—I require to convey water from a spring in the hills to a valley beneath, by cast-iron pipes, a length of 3,700 feet, in which there must be 58 bends to suit the windings of the hill.

The fall in 2,700 feet from the spring, to be 2 inches to 10 feet (or 45 feet perpendicular in that distance) with 50 bends, 8 of them formed from angles of 90, and 42 from angles of 135 degrees, the whole to be assumed as pipe 2-inch diameter in the bore. The other 1,000 feet, to have 8 bends only, and each at an angle of 135 degrees, the fall to be 21 inches to 10 feet, or 175 feet perpendicular in this length.

I wish to know the velocity with which water ought to flow through the first length (say 2-inch pipe), and to what diameter the bore may be reduced for the second length, to be just capable to carry all the water from the first length of 2-inch pipe.

If you will be so good as to insert this in The Builder, some of your correspondents may kindly give a practicable formula for the computations, and much oblige your humble servant and Constant Reader.

Bath, 20th April, 1846.

Strike in the Building Trade.—The strike, we are sorry to say, still continues. The loss to all parties must be immense.

Correspondence.

CURB STONES.

SIR,—A correspondent in your number of the 4th inst. refers to the curb stones used in Paris, as per sketch which you gave in your number of 21st March last, and says they might be made in cast-iron instead of stone. No doubt they might, but they would be made cheaper, and, I think, nearly as strong, of terro-metallic earth, such as is found in this district. A. B.

Stoke-upon-Trent.

Miscellanea.

ONE EFFECT OF A STRIKE.—Mr. S. Holme the builder, of Liverpool, recently wrote a letter to his workmen, in which he says:—"In no country, except Great Britain, are hod carriers generally employed. I never saw one in any part of the continent; and it is not only more convenient but more economical, in almost every instance, to hoist up materials, or use a wheelbarrow, than to pay men for carrying heavy loads up a ladder. We no more need to have bricks carried on men's shoulders than the merchant, in hoisting his goods into a warehouse, need adopt such an antiquated principle; yet I should be sorry to introduce machinery for this purpose, in every instance, as it would throw many poor men out of employment; but the labourers must be prepared for it, for the period is fast arriving when we shall be driven to hoisting instead of carrying, and a turn-out of hod carriers will precipitate the measure.

THE NEW HOUSES OF PARLIAMENT.—Lord Canning paid a visit of inspection to these works last Saturday, with reference more particularly to the fitting-up of one of the entire floors of the new building, overlooking the Thames, to supply the increasing requirements of the railway committees. Messrs. Grissell and Peto have, in consequence, received directions to complete immediately twenty of these apartments for the above purpose. The rooms in question are approached by a passage-way across the new building, communicating with the present temporary committee-rooms in the Star-chamber court, and they are in immediate connection with the new corridor, extending from one extremity of the building to the other, nearly 600 feet in length. There are upwards of 200 workmen employed in the operation.

THE GREAT WESTERN RAILWAY.—Bogue, of Fleet-street, has just published a "History and Description of the Great Western Railway, its Geology, and the Antiquities of the District," embellished with numerous views of the viaducts, stations, bridges, and antiquities, by J. C. Bourne. It is one of the finest works of the sort ever seen. We shall take an early opportunity to speak of it at length.

NEW APPLICATION OF THE HOT-BLAST.—A writer in the *Aberdeen Herald* says, that he has seen wood seasoned more thoroughly in the course of a few hours by applying the hot-blast than it could have been in many months by the present modes.

THE ACADEMY TRAVELLING STUDENTSHIP.—Not one drawing was received this year from the architects, who had gained gold medals at the Academy, in competition for this reward; consequently the privilege falls to the lot of a painter.

THE APPROACHING EXHIBITION.—It is said that the number of architectural drawings sent to the Royal Academy this year is less than has ever been known. This is no doubt occasioned by the engrossing nature of railway work.

IMPROVED COMMUNICATION.—As a precursor of the sub-marine railway (?), a submarine telegraph, connecting France and England, is to be commenced immediately, it is said, with the permission of both Governments.

TO PREVENT CONDENSATION ON SLATE COVERING.—A correspondent says, a coat of *drying oil* applied to the underside of the slates would be found effectual to prevent condensation.

SOCIETY OF ANTIQUARIES.—The annual election of officers took place on Thursday last, when the house list was carried. Lord Mahon is the president, recommended by both parties.

EXTRAORDINARY EXCAVATION IN THE CITY.—In the course of a few days an excavation, ordered by the commissioners of sewers at Guildhall, will be completed in the city, that was commenced about four months ago, and which extends from Whitefriars-dock to Fleet-street, opposite Craven-court. The whole length was tunnelled under the houses, which was an operation of considerable difficulty, and it was expected that the whole would not have been executed without some serious accident, but fortunately none has occurred. The sewer is constructed at a depth of about 23 feet from the surface. During the excavation the workmen discovered a vault, which was found to be about 80 feet long, reaching almost from Fleet-street to the Thames, nine feet wide and seven feet deep; it was built of the most durable material, and the pavement of it was formed of Roman bricks of a beautiful red colour. On Tuesday last two human skulls, with the thigh bones and part of a human chest were discovered.—*Globe.*

NEW PROPELLING POWER.—Mr. R. Mushet, of Coleford, concludes a letter to the *Mining Journal* as follows:—"Why not employ the force of a large steel spring similar to the spring of a watch, to put in motion a railway train? The spring might, from time to time, be wound up by the power of small stationary steam-engines; and as watches will go for twenty-four hours without winding up, why should not a locomotive, furnished with a similar source of power within itself, go for an equal space of time? Those who have seen and understand the construction of common musical snuff-boxes, will readily comprehend how the force of a spring may be made to communicate to the driving wheels of a locomotive any required degree of velocity; the little fly-wheel, or fan of the box, revolving at a rate far greater than would ever be required in railway locomotion."

NEW ROMAN CATHOLIC CHURCH.—The foundation-stone of this edifice, the estimated cost of which is 11,000*l.*, was laid at Burnley last week by the Right Rev. Dr. Brown.

DUTY OFF BRICKS.—We have received numerous communications on this subject, urging its immediate repeal. We will consider them shortly

MEETINGS OF SCIENTIFIC BODIES

During the ensuing Week.

MONDAY, April 27.—Geographical, 3, Waterloo-place, 8½ P.M.

TUESDAY, 28.—Civil Engineers, 25, Great George-street, 8 P.M.; Syro-Egyptian, 71, Mortimer-street, Cavendish-square, 8 P.M.

WEDNESDAY, 29.—Society of Arts, Adelphi, 8 P.M.

THURSDAY, 30.—London Institution, Finsbury-circus (anniversary); Royal, Somerset House, 8½ P.M.; Antiquaries, Somerset House, 8 P.M.

FRIDAY, May 1.—Royal Institution, Albemarle-street, 8½ P.M.; Botanical, 20, Bedford-street, Covent Garden, 8 P.M.

TENDERS.

For the Trinity Schools, under Mr. Bacvi, architect, Blackheath.

Piper and Son.....	£1,544 0
H. Johnson	1,458 0
Travers	1,398 0
G. Smith	1,371 0
Twoohay	1,360 10
Hill.....	1,317 0
Barr (not accepted)....	1,290 0

Mr. Hill's tender accepted.

For building schools at St. Thomas's, Goswell-street, St. Luke's. Mr. Hesketh, of Bermondsey-square, surveyor.

Watson	£1,876
Jay	1,654
Haynes and Co.....	1,636
Foster	1,599
Saunders.....	1,589

NOTICES OF CONTRACTS.

[We are compelled, by the interference of the Stamp Office, to omit the names of the parties to whom tenders, &c. are to be addressed. For the convenience of our readers, however, they are entered in a book, and may be seen on application at the office of "The Builder," 2, York-street, Covent Garden.]

For building a sewer along Upper Gower-street to the New-road, St. Pancras, being in length about 950 feet.

For building a bridge at Higham, Suffolk.

For the construction of the masonry, &c., of the Conway-bridge, for the Chester and Holyhead Railway Company.

For the erection of stations at Bearsby, Brooksby, Kirby, and Melton, on the Midland Railway.

For the erection of stations at Lincoln and Newark on the Nottingham and Lincoln Railway.

For the execution of works on the Syston and Peterborough branch of the Midland Railway. They are divided into two contracts. The lengths respectively are 4 miles 60 chains, including a tunnel of 750 yards, and 9 miles 40 chains.

For taking up the present stone floor and laying down a new floor in the County Hall, at Warwick.

For the execution of certain repairs to the workhouse, College-street, Bury St. Edmunds.

For the erection of an additional engine shed and tender, repairing shops, at the Derby station of the Midland Railway.

For the restoration of the eastern portion of the choir of Hereford Cathedral.

For the supply of 2,000 tons of chairs for the York and North Midland Railway.

For the execution of works on the London and Blackwall Extension Railway.

For building six new houses in Turner's-court, St. Martin's-lane, London.

For the construction of the various stations and other buildings from Cowton to Richmond, Yorkshire, for the Great North of England Railway Company.

For the execution of works on the Oxford, Worcester, and Wolverhampton Railway. There are four separate contracts, comprising large earthworks, bridges, and tunnels.

For the construction of a large gas-holder tank for the Lincoln Gas Light and Coke Company.

For lighting the parish of St. Paul, Deptford, with gas for a term of three years.

For the erection of certain buildings on the Sheffield, Ashton-under-Lyne, and Manchester Railway.

COMPETITION.

A premium of twenty guineas is offered for the most approved design, comprising plans, sections, and elevations for an hotel, to be built at Rugby, Warwickshire.

APPROACHING SALES OF WOOD, &c.

BY AUCTION.

At Stradbroke, Suffolk: 70 ash timbers, varying in size from 20 to 60 feet and very clean, also 3 capital elms, &c.

At the Bell Inn, Panfield, Essex: 250 oak timber trees now standing.

At Holbrook, near Ipswich: 24 good elm timbers, a quantity of pollards, &c.

At Hadleigh, near Rayleigh, Essex: 200 oak trees, now lying near Scrub House.

At the Rose and Crown Inn, Tunbridge: 638 oak trees, now standing on the Nizells estate.

At Poslingford, near Clare, Suffolk: 136 capital oak timbers,

At the White Horse Inn, Snettisfield, Warwickshire: 10 lots of superior elm timber trees of large dimensions and ready felled.

At Hadstock, near Linton; 300 valuable oak timber trees now being felled.

TO CORRESPONDENTS.

"*W. J. N.*"—The M.S. which accompanied drawing of font was mislaid.

"*Blistering of Paint.*"—A correspondent wishes to know how painted wood-work (especially in south aspect), may be prevented from blistering.

"*T. T.*" (Ringwood).—Take the opinion of a surveyor in the neighbourhood, who can examine the premises.

"*V. Y.*"—Complains of brickwork in New Oxford-street. We will examine it.

"*E. F. G.*"—We cannot authenticate the report. St. John's, Cambridge, was named.

"*J. Y. K.*"—Any time before July. If a letter be addressed to Mr. Hawkins, British Museum, by any person of known respectability, permission to study in the galleries will be granted.

"*Lover of Fair Play.*"—We cannot question the decision of a jury on anonymous statements. We will look into it.

"*R. L.*"—Weale, Holborn, has published a good work on the subject.

"*J. B. R.*" (Birmingham).—We shall be glad to hear from him again.

"*Leeds Industrial Schools.*"—We have received several communications on this subject, and will give them consideration.

"*M. S. B.*"—Next week.

"*Seasoning Oak.*"—A reply to "R. S." in our next.

"*A Young Beginner.*"—Look to "Tredgold's Carpentry."

"*J. Pulham.*"—Letter shall be sent to Col. Mason.

"*The Rev. J. B.*"—Future reports shall be less full.

Received.—"W. G." "Rev. J. F." "J. G. H." "B. B." "The Demoralization and Injuries occasioned by Want of Proper Regulation of Labourers engaged in the Construction of Railways," by Edwin Chadwick, Esq. (Chas. Knight); "Tables and Rules for calculating Earthwork, Land, Curves, &c., required in Railways and Canals," by J. B. Huntingdon, C.E. (Weale, 1846); Reply to "Observations of the Great Western Railway Company on the Report of the Gauge Commissioners." (Vacher, Parliament-street, 1846).

ADVERTISEMENTS.

ROYAL ADELAIDE GALLERY.—Arrival in England of the OHIO MELODISTS.—These extraordinary quartette singers and personators of Nigger eccentricity perform at this Institution every evening at 9 o'clock. Les Petites Danseuses Anglaises continue to receive unbounded applause in their elegant divertissement. A Concert every evening, conducted by Mr. A. Sedgwick: Vocalists—Miss Pearse, Mrs. Stuart, and Mr. Binge. Lectures on Chemistry. On Tuesday, Thursday, and Saturday, Major Beniowski on his New Invention of Printing for the Blind from usual types, at 3 o'clock. Microscope, Chromatrope, and Dissolving Views, daily. Admission 1s. Schools half price.

NOVELTIES of EXTREME INTEREST and INFORMATION at the ROYAL POLYTECHNIC INSTITUTION. Scenes in the Oregon Territory form a part of an entirely new series of Dissolving Views. Portraits of the most distinguished Men, in the Sikh Government and Army of Lahore, magnified by the opaque microscope. Also, Portraits of Sir H. Hardinge, and Sir Robert and Lady Sale. The Physioscope and Chromatrope, with new and beautiful variations. The most interesting of the novelties at work are Macintosh's Rotary Engine, Coleman's Patent Locomotive Engine, for ascending and descending Inclined Planes, Farrell's Archimedian Railway, an Envelope Cutting Machine, Wood's New Patent Steam Engine Governor, and the Atmospheric Railway. Experiments with the Diving Bell and Diver. Lectures on Chemistry and Natural Philosophy, with brilliant experiments. Admission, 1s.; Schools, Half-price. A brief description of the Oregon Territory, from Notes by a Nine Years' Resident, presented to the Visitors.

GREAVE'S LIAS CEMENT, stone-colour, free from vegetation, does not crack, and is well adapted for every description of modelling and casting. GROUND LIAS LIME, for concrete, or as mortar for sewers, dock-walls, and hydraulic works generally; is superior to any other lime or cement.—Office, 2, South Wharf, Paddington, and Stratford-on-Avon.

Agent for Liverpool—Mr. Wylie, 56, Gloster-street.
Ditto, Manchester—Mr. J. Thompson, Back King-street.
Ditto, Chester—Mr. J. Harrison, Linen Hall-street.
N.B. Marble Floors. A large quantity of Vein and Black Marble on sale at reduced prices.

ROMAN CEMENT, &c.
REMOVAL.
THOMAS JOHN CROGGON
Begs to inform the Trade that he has removed to 9, LAWRENCE POUNTNEY-HILL and THREE CRANES WHARF, 69, Upper Thames-street.
Orders addressed to either place for ROMAN CEMENT of genuine quality will be executed with promptitude and the strictest regard to quality and economy.

KEENE'S PATENT MARBLE CEMENT.
WITHOUT noticing CAUTIONS, which are as absurd as they are uncalled for, or disproving assertions, which carry with them their own refutation, the patentees of KEENE'S CEMENT venture to believe, that this material will very advantageously stand the test of comparison with any cement of a similar nature, however INVALUABLE, now before the public. They derive this opinion from its all but exclusive use in the new buildings north of Hyde-park, on the Brompton estate, and in many other public and private edifices, both in London and the country. Amongst others may be mentioned the works recently executed at the Colosseum, Regent's-park, where its hardness and beauty of appearance have caused it to be extensively used for skirting and other mouldings, in place of wood, for columns instead of marble, and as a substitute for stone in paving the floors of the corridors and conservatories.
Patentees and manufacturers, J. B. WHITE & SONS, Milbank-street, Westminster,

MARTIN'S FIRE-PROOF AND ORNAMENTAL CEMENT.
CAUTION.—Messrs. STEVENS and SON, Patentees, beg to caution their friends and the trade generally against confounding this invaluable Cement with others, erroneously said to be of the same description. S. and S. pledge themselves, that MARTIN'S CEMENT is totally dissimilar in composition and manufacture from every other, and, being a neutral compound, is not only free from chemical agency upon any substance with which it may come in contact, but completely resists the action of the strongest acids. They feel it a duty to direct attention to the following properties, which it exclusively possesses:—
1. It rapidly acquires the hardness of stone.
2. Unlike other internal cements, its hardness is uniform throughout its entire thickness.
3. Its surface (which may be made equal to that of the finest marble) NEVER THROWS OUT ANY SALT, and will receive paint in four days, without peeling, when put upon dry work.
It is peculiarly adapted as an internal stucco for walls, skirtings, architraves, mouldings, and enrichments of all kinds, to all of which purposes it has been extensively applied by Mr. Thomas Cubitt on the Grosvenor estate, &c.
For the above purposes, it possesses great advantages over wood, being more economical and durable, resisting fire, damp, and vermin.
For the floors of hall and fire-proof warehouses, its lightness, durability, and uniform surface give it an immense advantage over stone, being, at the same time, much more economical. The most satisfactory references can be given. To be had of the Patentees, Plaster of Paris and Cement Manufacturers, 186, DRURY LANE.
Agent for Liverpool and Manchester, Mr. R. PART, 28, Canning-place, Liverpool.

TO ARCHITECTS, ENGINEERS, CONTRACTORS, BUILDERS, MASONS, AND PLASTERERS, MERCHANTS, SHIPPERS, AND THE PUBLIC IN GENERAL.
JOHNS and CO.'S PATENT STUCCO CEMENT.—The following are the positive advantages possessed by this Invention over every Cement hitherto introduced:—It will effectually resist Damp. It will never vegetate nor turn green, nor otherwise discolour. It will never crack, blister, nor peel off. It will form a complete Stone casing to any Building covered with it. It so closely resembles Stone that it is impossible to detect it. It never requires either to be painted or coloured. It will keep fresh and good in the cask in any Climate for any number of years. It is the only Cement that can be depended upon for export. It is the only Cement that can be used with confidence by the Sea-side. It may be used in the hottest or coldest Climates at any season. It will adhere to any substance, even to Wood, Iron, or Glass. It will carry a larger Proportion of Sand than any other Cement. It matures by age, and becomes perfect when other Cements begin to perish. It may be worked through the Winter, as frost has no effect upon it. It may be used on the Inner Walls of new Houses, which may be papered over or painted directly. Roofs laid or pointed with this Cement will remain undamaged by the severest Storms. Any Plasterer may apply it, the Instructions for use being very clear and distinct. The first cost of this material does not exceed that of the cheapest Cement now in use; but with all the above-named extraordinary and valuable advantages, nothing can approach it in point of economy.
Architects and Builders who have used this Cement have declared that it requires only to be known, to be universally preferred.
Specimens may be seen, and a Prospectus fully describing the Cement and its mode of application, together with a volume of Testimonials from every part of the Kingdom, may be obtained on application at the office of "The Builder," and of MANN and CO., SOLE AGENTS for the Patentees, 8, Maiden-lane, Queen-street, Cheapside, London: of whom also may be had,
JOHNS and CO.'S PATENT STONE-COLOUR STUCCO PAINT, expressly intended for Painting over exterior Walls of Houses that have been covered with Roman or other Cements, and which have become dirty and discoloured. It is in every way better suited for this purpose than White Lead Paint, which will frequently come off in flakes, being in direct chemical opposition with Cement; whereas MESSRS. JOHNS and CO.'S PATENT PAINT having an affinity for Stucco, binds itself with it, stopping the suction, thereby rendering the wall proof against weather, and in the finish producing a pure stone-like effect, producible by no other Paint whatever. It is cheap in its application,—and may be used by any Painter, in any climate, even in the most exposed Marine situations.

PORTLAND CEMENT does not vegetate, requires no colouring, is perfectly hydraulic, and resists the action of Frost. The cost of the material and of working it is about the same as Atkinson's Cement, Manufactured by J. B. WHITE and SONS, Milbank-street, Westminster, and sold at their Warehouses:—
Druce's Wharf, Chelsea,
Bell's Wharf, Paddington,
Earl-street, Blackfriars,
Albion Wharf, Deptford-bridge,
by Salmon and Co., Dublin,
and at 36, Seel-street, Liverpool.

BLUNDELL'S STUCCO PAINT.—An article perfectly resembling stone surface, for the purpose of covering the outside of buildings, has long been a desideratum. This STUCCO PAINT possesses the necessary qualities. It adheres firmly to the walls, resists the action of the weather, and is altogether free from the glossy appearance of Oil Paint. It is laid on mixed with rain or pure river water, and can be made to any required shade or stone colour. Further particulars may be obtained on application to the Inventors, BLUNDELL, SPENCE, and Co., Paint and Colour Manufacturers, 69, Upper Thames-street, London; and at their Colour Works, Hull.

MUIR'S PATENT PLANING MACHINERY.
SAW MILLS, GILLINGHAM-STREET, PIMLICO.
TIMBER of any Size, PLANK, DEALS, and BATTENS, &c. Sawn on the most approved principle. Boards, &c., Prepared, Matched, and Grooved, by Muir's Patent Machinery. The Mills have all the advantages of navigation and water-carriage, being connected with the Thames by the Grosvenor-canal. Goods fetched from the docks and carted home free of charge.
Address to HENRY SOUTHAM,
Saw Mills,
Gillingham-street, Pimlico.
N.B. Estimates given for Sawing and Planing.

THE GENERAL WOOD CUTTING COMPANY, TIMBER and DEAL SAWING and PLANING MILLS, Belvedere-road, Lambeth, near Waterloo-bridge.—SAWING in all its branches executed with the greatest precision and despatch. PLANING by the most approved Machinery, reducing the Boards to a parallel width and thickness, and grooving or matching with undeviating accuracy. The operation economizes time, money, and material.

SIR WILLIAM BURNETT'S PATENT for the Preservation of Timber, Canvas, Cordage, Cotton, Woollen, &c., from Decay.
TESTIMONIALS.
From THOMAS GRAHAM, Esq., M.A., F.R.S., L. and E., Professor of Chemistry, University College, London.
"After making several experiments on wood prepared by the solution of chloride of zinc for the purpose of preservation, and given the subject my best consideration, I have come to the following conclusions.
"The wood appears to be fully and deeply penetrated by the metallic salt; I have found it in the centre of a large prepared paving block.
"The salt, although very soluble, does not leave the wood easily when exposed to the weather, or buried in dry or damp earth. It does not come to the surface of the wood by efflorescence, like the crystallizable salts. I have no doubt, indeed, that the greater part of the salts will remain in the wood for years, when employed for railway sleepers or such purposes. This may be of material consequence when the wood is exposed to the attacks of insects, such as the white ant in India, which I believe would be repelled by the poisonous metallic salt.
"After being long macerated in cold water, or even boiled in water, thin chips of the prepared wood retain a sensible quantity of the oxide of zinc; which I confirmed by Mr. Toplis's test, and observing that the wood can be permanently dyed from being charged with a metallic mordant.
"I have no doubt, from repeated observations made during several years, of the valuable preservative qualities of the solution of chloride of zinc, as applied in Sir. W. Burnett's process; and would refer its beneficial action chiefly to the small quantity of the metallic salt which is permanently retained by the ligneous fibre in all circumstances of exposure. The oxide of zinc appears to alter and harden the FIBRE of wood, and destroy the solubility, and prevent the tendency to decomposition of the azotised principles it contains, by entering into chemical combination with them.
(Signed) "THOMAS GRAHAM."
"University College, 25th October, 1845.
From Professors BRANDE and COOPER.
"London, 4th November, 1845.
"SIR,—We have this day again examined the specimens of canvas and wood prepared according to the specification of your patent, and which, in the month of April, 1844, we placed in a damp cellar, where they have remained up to this date.
"We are now enabled satisfactorily to corroborate the favourable opinion expressed in our former report. The canvas remains amply protected from all fungous vegetation and rottenness, while a corresponding sample of the same piece, which had not been prepared by immersion in the solution of chloride of zinc, is entirely decayed, being mouldy, rotten, black, and in places resembles timber.
"We have also lately compared the strength of a fibre of a piece of canvas which we prepared according to your specification, in October, 1844, with that of the fibre of the same canvas, unprepared, and find that it has in that respect sustained no injury. We are therefore of opinion that your process will not, after any lapse of time, tend to deteriorate the strength of the fibres of the substances in question.
"In regard to the several samples of different species of wood above adverted to, each of which was cut into two, one half being imbued according to the directions of your specification with the dilute solution of chloride of zinc, while the other half was left in its original condition, we have also to make a favourable report, and to repeat our opinion of the efficacy of your process as a preventive of dry rot, and similar sources of decay; the unprepared specimens are manifesting symptoms of decay and mildew, while those which have been protected by your preparation are clean and sound.—(Signed) "WILLIAM THOMAS BRANDE,
"JOHN THOMAS COOPER."
"To Sir William Burnett, K.C.H., F.R.S., &c. &c."
Testimonials from numerous other parties may be obtained on application, personally or by letter, to the Secretary, and specimens may be seen at the Office, 53, King William-street, London-bridge.

PREPARED FLOORING BOARDS.
AT REDUCED PRICES.
ALWAYS ON SALE, a LARGE ASSORTMENT of DRY PREPARED FLOORING BOARDS and MATCHED BOARDING of all sorts, planed to a parallel width and thickness, from ¾ inch to 1¼ inch thick. Rough Boarding for Flats.
TIMBER, DEALS, OAK PLANKS, SCANTLINGS, SASH SILLS, &c.
Apply at W. CLEAVE'S Timber Yard, Smith-street, Westminster.

PREPARED FLOORING BOARDS.
ALWAYS ON SALE at A. ROSLING'S, SOUTHWARK-BRIDGE-WHARF, BANKSIDE, and Old-Barge-Wharf, Upper Ground-street, Blackfriars, a very large stock of well-seasoned Floor Boards of every variety.
A. R., in calling the attention of builders and consumers, confidently presumes on his being able to supply them on such advantageous terms, as will ensure and merit their favours and approbation.

DRUCE'S No. 2, WHARF, late Paradise-wharf, Chelsea.
TO THE TRADE.—Parties desirous of delivering Timber Deals, Stone, Bricks, or any other goods, in the districts of Chelsea, Brompton, Fulham, Kensington, &c. &c., will find great facilities of Wharfage, Cranage, or Delivery, by applying as above.
N.B.—A weighbridge on the premises.

WILLIAMS'S PATENT SLATE RIDGES and HIPS.—The above article is recommended as the best and the most suitable covering for Ridges and Hips of slated roofs ever invented, possessing a solid Roll of various sizes, more elegant and durable than lead, and 30 per cent. cheaper.—Sold by Messrs. J. and J. SHARP, Slate Merchants, Tooley-street, and Mr. RICHARD COOPER, Slate Merchant, Belvedere-road, Lambeth, London.

DAVEY'S PATENT SLATE RIDGES and HIPS are very superior in appearance to lead, as well as more durable and much cheaper, and are admitted to be the most valuable articles for the purpose hitherto invented. They consist of two side pieces and a roll, either united together to form one solid piece, or in separate parts, and in lengths of from four to six feet. The roll is made of various sizes, perfectly round, and in the strongest way of the slate. They may be purchased of the patentee, W. DAVEY, Broad Quay, Bath, or of any slate dealer in London or the country. Parties ordering a cargo of roofing slates may procure these ridges at the cheapest rate from Mr. JAMES WYATT, Port Penrhyn, Bangor (where they are manufactured), of whom and of the patentee further particulars and prices may be obtained.—Be particular to order DAVEY'S Patent.

ENCAUSTIC, VENETIAN, and other PATENT TILES and MOSAIC PAVEMENTS may be purchased at MINTON and Co.'s warehouse, 9, Albion-place, Surrey side of Blackfriars-bridge.—Wyatt, Parker, and Co., Agents. The above tiles have lately been considerably reduced in price.
N.B. An assortment of plain and ornamental door furniture, slabs, and tiles for fire-places, &c.

HIP TILES to suit slate roofs in colour; Ridges, with plain or rebated joints, roll tops, and vertical ornaments; drains, many sizes, with plain or socket joints; paving in squares, hexagons, octagons, &c., different colours; roofing, in Grecian or Italian styles, other devices also, or plain; conduits, which do not injure pure water; fire-bricks and tiles; clinkers, and out-door paving; sundry wall-coping, garden-borders, chimney-tops; also tubular and other flues of peculiar material. No agent, but a depôt at 22, WHITEFRIARS-STREET, FLEET-STREET, LONDON, under Mr. PEAKE'S personal care, to supply genuine TERRO-METALLIC goods at fair prices as per quality; also, additional Stock at No. 4 Wharf, Macclesfield-street, South, City Basin.
The TILERIES, TUNSTALL, STAFFORDSHIRE, are near the centre of England, whence boats are sent direct to any inland place; or to the Mersey for the coasts, the colonies, and elsewhere.

TO BUILDERS AND MECHANICS.
THE COMMERCIAL FOREIGNERS and GENERAL INVESTMENT ASSOCIATION.
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J. Della Torre, Esq., 70, Lamb's Conduit-street.
R. Sanderson, Esq., 9, Brook-street, Holborn.
PRESIDENT.—John Peto, Esq.
Present Entrance Fee, 2s. 6d.; Subscriptions, 10s. per month; Shares, 120l.
First subscriptions due on Thursday, 7th May, at the offices.
To Builders and Mechanics this association is peculiarly adapted, it enabling them to build or finish houses, and generally to acquire property without any outlay of their own capital. The large and excessive fines, fees, &c., which the borrower is obliged in most other societies to pay, being in this wholly done away with, the borrower being only answerable for the payment of his subscriptions. Amongst other important advantages it will be found in this society there is no Redemption Fee—no Fine on Withdrawal—no Bidding for Shares—no Deducting of Discount from amount to be advanced—no Postage Fees—Reduced Law Charges—no Excessive Fines. INTEREST AT FIVE PER CENT. ALLOWED ON EVERY PAYMENT. Members assisted to purchase at auction and pay deposit. The Directors act gratuitously.
Members can withdraw the whole of their subscriptions at any time, and receive interest thereon at 5l. per cent. Females and minors may become members.
Prospectuses may be obtained and shares taken of the Secretary at the offices at any time of the day; the Solicitor, W. A. Bivolta, Esq., 44, Bloomsbury-square; the Surveyor, Mr. Bray, 250, High Holborn; and of the Manager, 5, Crosby Hall Chambers, Bishopsgate-street. Prospectuses forwarded by post on receipt of one postage stamp.
An early application for shares and advances is desirable. Country Members can pay their subscriptions to an agent, who will be paid by the Association; and local surveyors will be appointed. Applications for appointment as surveyors and agents should be made at once.
THOMAS PAVEY, Manager.